

LITTER IN OPEN SPACES OF MULTI-FAMILY
HOUSING SITES

by
RANDALL M. IMAI
B. Arch., University of Utah
1971

SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE
DEGREE OF MASTER OF
ARCHITECTURE,
ADVANCED
STUDIES

at the

MASSACHUSETTS INSTITUTE OF
TECHNOLOGY

June, 1973

Signature of Author.....
Department of Architecture,
May 25, 1973

Certified by.....
Thesis Supervisor

Accepted by.....
Chairman, Departmental Committee
on Graduate Students



LITTER IN OPEN SPACES OF MULTI-FAMILY HOUSING SITES

Randall M. Imai

Submitted to the Department of Architecture on May 11, 1973 in partial fulfillment of the requirements for the degree of Master of Architecture, Advanced Studies.

The purpose of this thesis is to describe a relationship of resident maintenance of outdoor spaces to the management function in multi-family, low-rise housing sites by examining the role that physical design plays in modifying that relationship. The measure used for the examination is litter that collects in the open spaces of housing sites, looking particularly at where litter collects, where litter does not collect, where litter gets cleaned-up, and by whom.

The intent is to supply additional information to the field of housing site design in hopes of increasing the rationale of attempts at solving this physically-, institutionally-, and socially complex problem by the investigation of existing housing projects in the metropolitan Boston Area.

This study is divided into four sections: (1) an introduction setting the context of the study and describing how the study was carried out, (2) a general description of the projects investigated and some general findings, (3) the major findings, categorized into a description of where litter comes from and a description of who cleans it up, and (4) some general conclusions.

A few words about the sample sites investigated. Most of the projects studied are row-house dwelling units with ground contact. All of the projects are occupied by "moderate"-income families and were built under FHA Section 221(d)(3) or Section 236 financing. This is not to imply, however, that the subject matter restricts itself to lower-income, publicly-assisted housing. A relationship between tenant and management exists in all types of rental housing, the differences occurring primarily in the amount of service the management provides or is able to provide.

Thesis Supervisor: Tunney Lee

Title: Associate Professor, Dept. of Urban Studies & Planning and Dept. of Architecture

TABLE OF CONTENTS

Abstract

Table of Contents

1. Introduction: Statements on Housing and on Litter
 - 1.1 Some Reasons for the Study
 - 1.2 Characteristics of the Type of Housing Studied
 - 1.3 Aspects and Implications of Litter on Housing Sites
 - 1.4 How the Study was Done and How It Wasn't Done
2. Descriptions of the Projects Investigated
 - 2.1 Warren Gardens, Roxbury, Mass.
 - 2.2 Charlame I, Roxbury, Mass.
 - 2.3 Roxse Homes, Boston (South End), Mass.
 - 2.4 Westminster Court, Roxbury, Mass.
 - 2.5 Presidential Courts, Stoughton, Mass.
 - 2.6 Cochituate Homes, Framingham, Mass.
3. Findings: Where Litter Comes From and Where It Goes
 - 3.1 Describing a Litter Pattern
 - The Formal Garbage Collection System
 - Play Leftovers: the Impact of Children
 - The Litterer
 - Site Details that Collect Litter
 - The Litter Pattern: Origins and Destinations
 - 3.2 Describing a Clean-Up Pattern
 - Site clean-up done by individual residents
 - Collective resident clean-up of communal areas
 - The role of management
 - The clean-up pattern: who cleans up and where
4. Conclusions: Some Statements on Housing and Litter and the Study
 - 4.1 Larger Findings Based on Comparison of Projects
 - 4.2 The Validity of Litter as an Indicator of Activity

1. INTRODUCTION: STATEMENTS ON HOUSING AND ON LITTER

1.1 Some Reasons for the Study

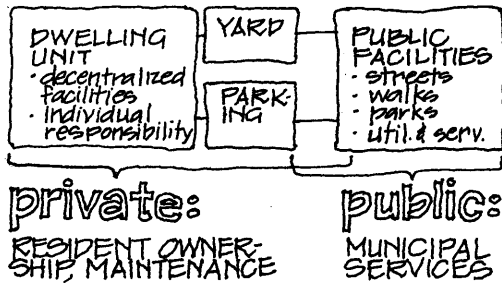
"By close attention to existing reality and particularly to the difficulties or 'misfits' that reality exhibits, the planner often finds that suggestions for design seem to rise immediately out of a problem. . . . We are much better at recognizing problems and misfits than we are at imagining ideal solutions."

Kevin Lynch, Site Planning

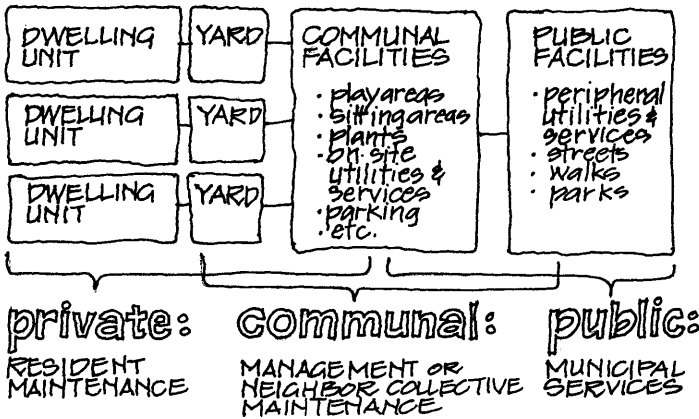
This thesis is intended to be the first of a series of investigations that seek to ascertain the various things-that-go-on on multi-family housing sites--their active and non-active uses, their facilities and services, their problems. This investigation looks at the phenomenon of litter as quasi-measurable evidence of some aspects of those "things" in open-spaces of some housing sites in and around metropolitan Boston, the object being to describe a relationship of resident self-maintenance of outdoor spaces to the management function and the role that physical design plays in modifying that relationship. The assumption here is that increased rationale for decision-making is both possible and desirable to supply a closer link between the delivery of housing and the use of housing, and that, in part, this rationale can be obtained by examining existing housing.

The direction of development in urban areas towards attached, multi-family housing provides the main interest of this thesis in those types of houses. But to a designer, perhaps more immediate, is the aspect of a different definition of "ownership" of multi-family housing sites than generally applies to single-family detached houses.

From a resident standpoint, "ownership" here does not necessarily refer to the legal or paper-definition of such; rather, it refers more to the concept and attitude of territorial-rights exercised by the resident in



prototype for
single-family
development
(PRIMARYLY RESIDENT-OWNER)



prototype for
multi-family
development
(PRIMARYLY RENTAL-ROWHOUSE)

Fig. 1 Two Examples of "Ownership" as Defined by Use and Maintenance Responsibilities

terms of use, protection, and maintenance of various "parts" of the site, including traditional "private" areas, "communal" areas that are designated to be commonly-held by more than one dwelling unit, and the "public" areas that are accessible and usable by anyone.

How much of a multi-family site "belongs" to a dwelling? Does the concept of ownership extend beyond the walls of the dwelling unit, and if so, are the boundaries of this turf recognized and respected by both the owner and the non-owner? These are the larger questions that form the direction and areas of inquiry for the thesis.

1.2 Characteristics of the Type of Housing Studied

The type of housing studied is multi-family where some facilities, services, and problems are communal or shared by several dwelling units. It is new construction--less than ten years old, and it is low-rise (no

buildings being over four stories in height.) Most of the projects are row-houses with ground contact. All of the projects are occupied by "moderate"-income families and were built under FHA Section 221(d)(3) or Section 236 financing. As such, all of the dwellings are rental units.

New construction rather than older structures or rehabilitation is investigated because it is felt that recent design approximates more closely the development attitude/environment of the present and near future than do earlier efforts.

On the assumption that a dwelling unit's proximity and relationship to the ground influences a resident's use of the open spaces of the site, and assuming that the impact of common facilities and services within the building are minimal or non-existent in low-rise housing, this study limits itself to low-rise housing with the emphasis on row-houses, or "townhouses" with ground contact, rather than to involve itself with the implications of high-rise elevator apartments.

But perhaps the most significant characteristic of the type of housing investigated is the income-level, defined "moderate" by federal standards, of the residents. Correspondingly, the rent levels are also "moderate" in comparison to new, higher-income, market rate housing of "equivalent" design, and in turn, the reduced cash flow has effect on both initial construction costs (through mortgage repayment) and on-going operational costs (management and maintenance).

In addition to the aspect of cash flow, another characteristic of such publicly assisted housing that arises from the income level and corresponding mobility of the residents is the impact that the existing market has on management maintenance. At higher income levels, housing management must consider site maintenance a capital expenditure, like

advertising, making more attractive the dwelling unit to prospective tenants of vacant apartments as well as maintain a level of satisfaction among its existing tenants lest they move out. At the moderate-income level however such market pressures on management are much less (with vacancies at 0-1% at the projects studied and waiting lists for most projects). The impetus for management site cleanup then must come either from resident demands or the combined desire and ability (i.e., fewer other operational expenses) of the management to maintain a "clean" site.

It was reasoned therefore that if the site had a lower management input to site clean-up, site litter would be more prevalent and it would be easier to identify where littering and clean up took place.

While the foregoing describes some of the basic similarities of the projects investigated, the intent was to select projects with a few specific differences in order that a variable cross-section could be presented.

The primary difference among the projects is the location. The projects were selected in an effort to represent inner-city, outlying neighborhood, and outer suburban conditions. However it should be mentioned that the inner city and outlying neighborhood locations selected here are both renewal areas. The suburban locations (two) are separate, incorporated towns on the fringe of metropolitan Boston.

Differences also occur among the projects as to demographic make-up (primarily size of household and number of children), house type (row-houses and walk-up apartments), and lease agreement (straight rental and co-operative).

1.3 Aspects and Implications of Litter on Housing Sites

The initial reasons for selecting litter as the focus of study are

mentioned here. While looking at some housing projects of the type described above, it was observed that there are some apparent mis-matches between the assumed or "intended" uses of the site and the apparent actual uses: after five years of habitation, the housing sites don't look like the designers' renderings. Of all the changes (from that original picture) that occur like intentional or accidental breakages, grafitti, improvements to dwelling grounds and buildings done by residents, wear, etc., litter-- the "random" depositing of objects not intended to be retrieved or re-used--seemed to be the most consistently occurring. For this reason, it was assumed that the litter process affects and involves many people--that is, because of its dispersal many people were probably littering and because of its relatively consistent presence, many people would be exposed to-- and affected by litter. In a sense, litter on a residential site might be thought of as an invasion of privacy or "territorial rights" of the occupants of a dwelling (the psychological-legal-architectural epitome of privacy).

At the same time, because of its consistency, places of no or little litter are "conspicuously" present. Variations in litter levels do occur from site to site of the same "type" and from place to place on the same site. The "why's" of these phenomena form the basis of the study: Why does litter occur in some places and not in others? and Why does litter get cleaned-up in some places and not in others?

1.4 How the Study Was Done and How It Wasn't Done

This study was seen primarily as an exercise in observation, using litter as an "unobtrusive" measure of activity on the site that could be observed in absence from and after-the-fact of the actual activity (assuming that litter indeed carries the implications assigned to it by the

study). The process was one of identifying actors--the people and forces that cause litter and people and forces that react to its presence--and describing the observable differences between a place of heavy litter and a place with little or no litter. The major independent variables are differences in resident make-up, differences in management services, and differences in considerations of "design"; the dependent variable is litter.

The projects that are presented in the following section are not meant to be in-depth case-studies. Indeed, the reader will find that description of the projects in terms of development, occupancy, management, and design are, at best, sketchy. More emphatically, it is not intended that "evaluation" by any criteria of each site become an objective of the study. It would be over-simplistic to suggest that a "good" housing site is one with no litter on it.

Rather, mapping of the occurrence of litter relative to the location of public, communal, and private areas on each site formed the basic work at each of the sites, coupled with casual conversation with passers-by to help understand some of the non-visible things of the site. The projects therefore were looked at much like one would look at a catalog: a collection of common entities that exhibit something that other places do not.

2. DESCRIPTIONS OF THE PROJECTS INVESTIGATED

This section of the study presents a brief description of each of the projects investigated, followed by a graphic section which shows a sketch site plan of each project, the locations on each site where relative litter levels occur, and a drawing trying to coordinate these locations of litter with some reasons and speculations as to why the litter occurs where it does.

2.1 Warren Gardens, Roxbury, Mass.

Two-hundred and twenty-seven units of two and three level row houses on a hilly site in Washington Park (Roxbury). Twenty-two efficiency units, thirteen one-bedroom, one-hundred and eighty three bedroom, and twelve four-bedroom units located on Warren Avenue near Dudley Station. Construction was completed in 1968. Warren Gardens provides rental housing for moderate and low income families. All one-, three-, and four-bedroom units have private yard space at ground level that is contiguous with the dwelling unit. The units are arranged and sited to provide many varieties of public, communal, and private open-space. Of all the projects studied Warren Gardens probably had the highest overall litter level as well as being one of the highest in density. For this reason and for its architectural qualities, it comprises the bulk of the photographs and exemplary situations in the later sections of the study.

2.2 Charlamé I, Roxbury, Mass.

This project was selected primarily because of its proximity to Warren Gardens (the two are visible from each other) and because it is antithetical to Warren Gardens in many ways, among these are demographic make-up (substantially smaller units in the two- and three-bedroom range), its provision of little common open space (except vehicular), and its

site arrangement. The buildings at Charlame I are row-houses arranged in parallel rows at ninety degrees to a linear access street. The rows are arranged such that "fronts" of units face each other across a parking street (cul-de-sac), rear yards face each other separated by fences and a narrow (6'-0") path. Common spaces are limited to the parking areas and streets and walks and small seating groups are located at one end of each pair of rows.

2.3 Roxse Homes, Boston (South End), Mass.

One-hundred and ninety-eight three-story walk-up apartments located on level ground in fairly dense residential-commercial-industrial area of Boston. Roxse is composed of three sites; the two sites of low-rise housing were looked at. The first site is comprised of twenty-one two-bedroom, sixty-three three-bedroom, and forty-two four-bedroom units (two groups of three units share a common entry/stairwell) arranged in a S-shaped pattern with parking and playgrounds alternately placed in the consecutive courts. The second site is comprised of eighteen two-bedroom, thirty-nine three bedroom, and fifteen four-bedroom units arranged around a row of old South End row houses, with parking and service separating the two. Construction was completed in 1971. Roxse provides rental housing for low- and moderate-income families. No private outdoor space is provided for any unit, but each unit either faces onto a play area and parking or a play area and a street.

2.4 Westminster Court, Roxbury, Mass.

Seventy units of two- to four story walk-up apartments in Washington park (Roxbury). Twenty-four one-bedroom and forty-six two bedroom units are arranged around courts that form one large court. One bedroom units have twenty square-foot of balcony space; two-bedroom units have no

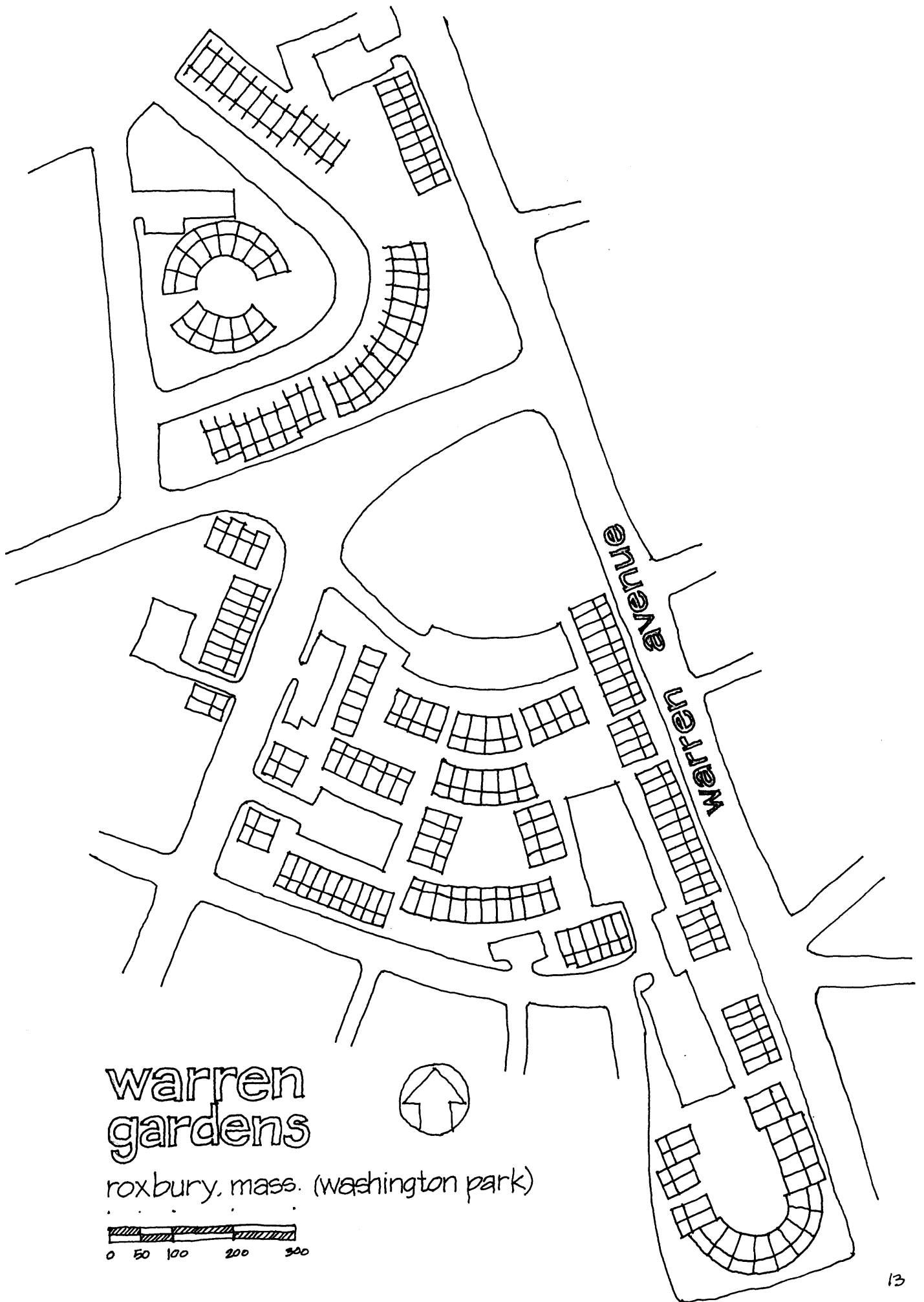
private open space. Westminster Court was completed in 1967 and provides rental housing for moderate income families.

2.5 Presidential Courts, Stoughton, Mass.

One-hundred and four units of row houses on a flat site in Stoughton, Mass. Sixteen one-bedroom, fifty-two two-bedroom, twenty-eight three-bedroom, and eight four-bedroom units arranged in four distinct courtyards with paved access paths separating the four courtyards. "Fronts" of the units are on the court yard and a small private yard space is provided at the rear of each unit except for the one-bedroom units. Upper level balconies face onto the courtyards. Presidential Courts is cooperative housing for moderate income families. A community building provides laundry facilities, a meeting room, and the management office.

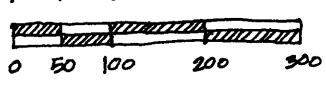
2.6 Cochituate Homes, Framingham, Mass.

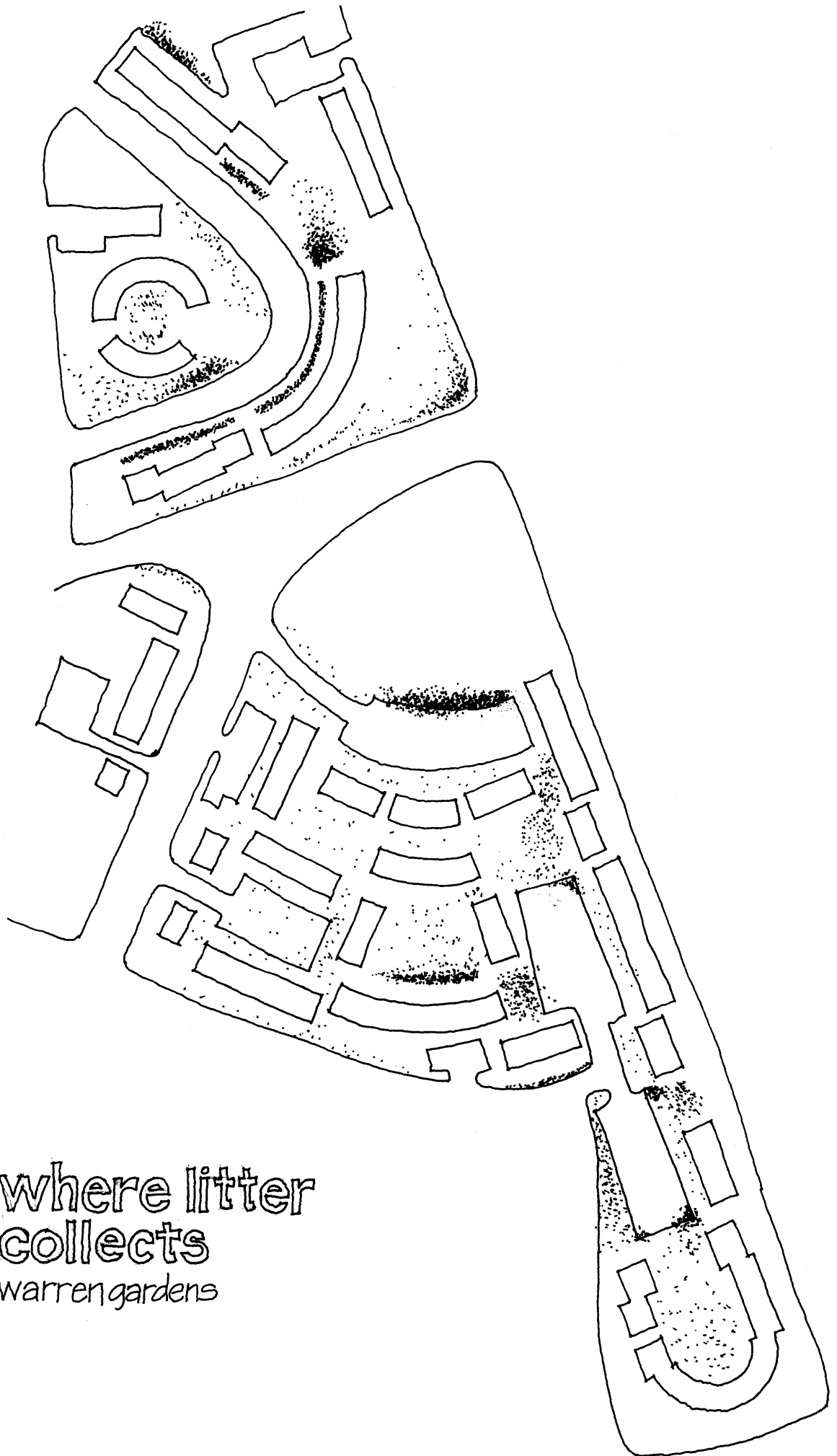
One-hundred and fifty-five units of housing on a relatively flat site in Framingham Massachusetts. Thirty-two one-bedroom, sixty two-bedroom, fifty-three three-bedroom, and ten four-bedroom units arranged in buildings with four units per building, each unit having ground contact (each unit occupies one corner, or quadrant, of each two-story building). Buildings are mostly detached and arranged around parking lots and communal play areas. The one-bedroom apartments are grouped together at one end of the site. One-bedroom units are single-level units stacked to form two-level rows of buildings. Cochituate Homes is cooperative housing for moderate income families. Two community buildings (grouped together) provide day-care and laundry facilities, a meeting room, and the management offices.



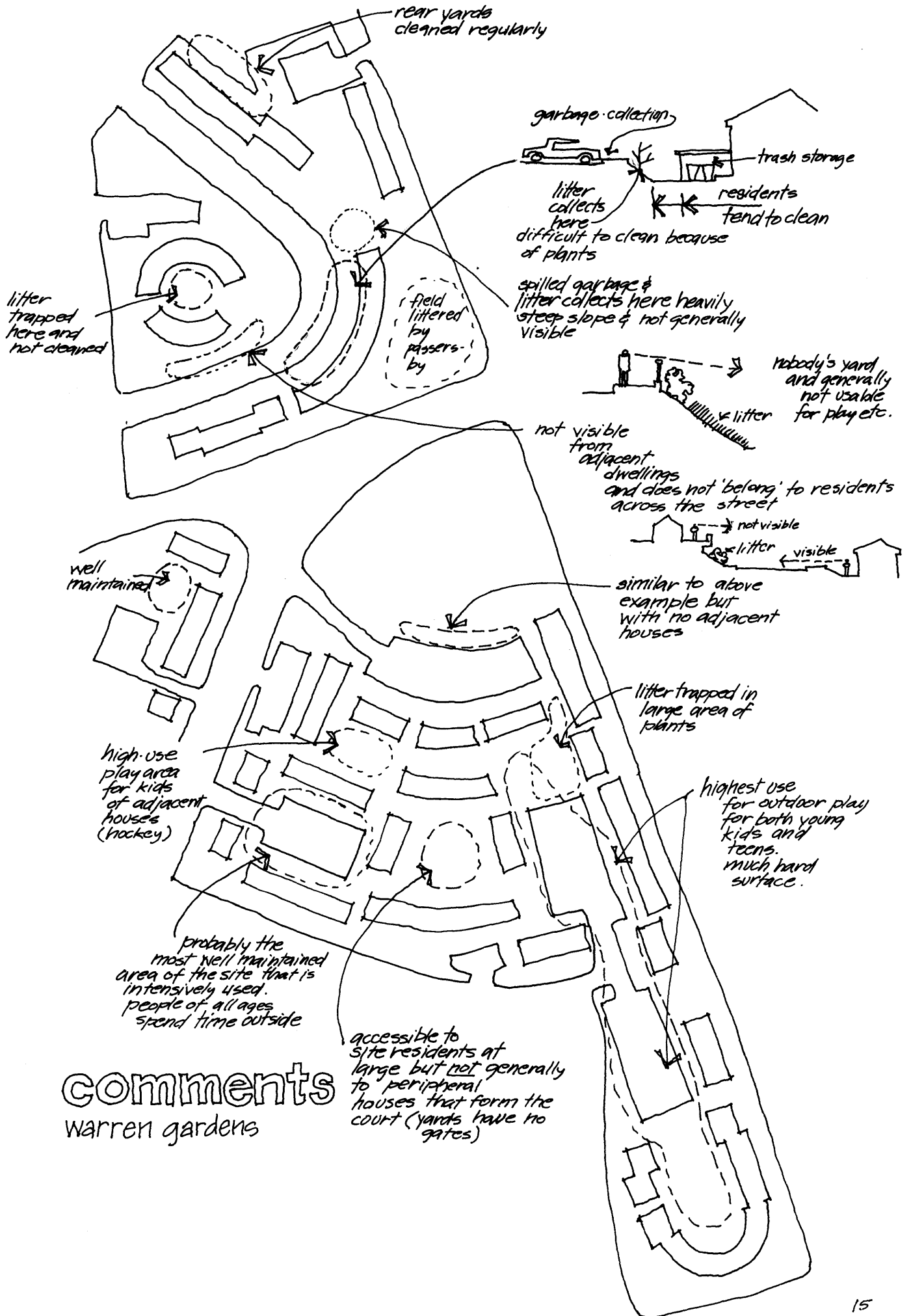
warren
gardens

roxbury, mass. (washington park)



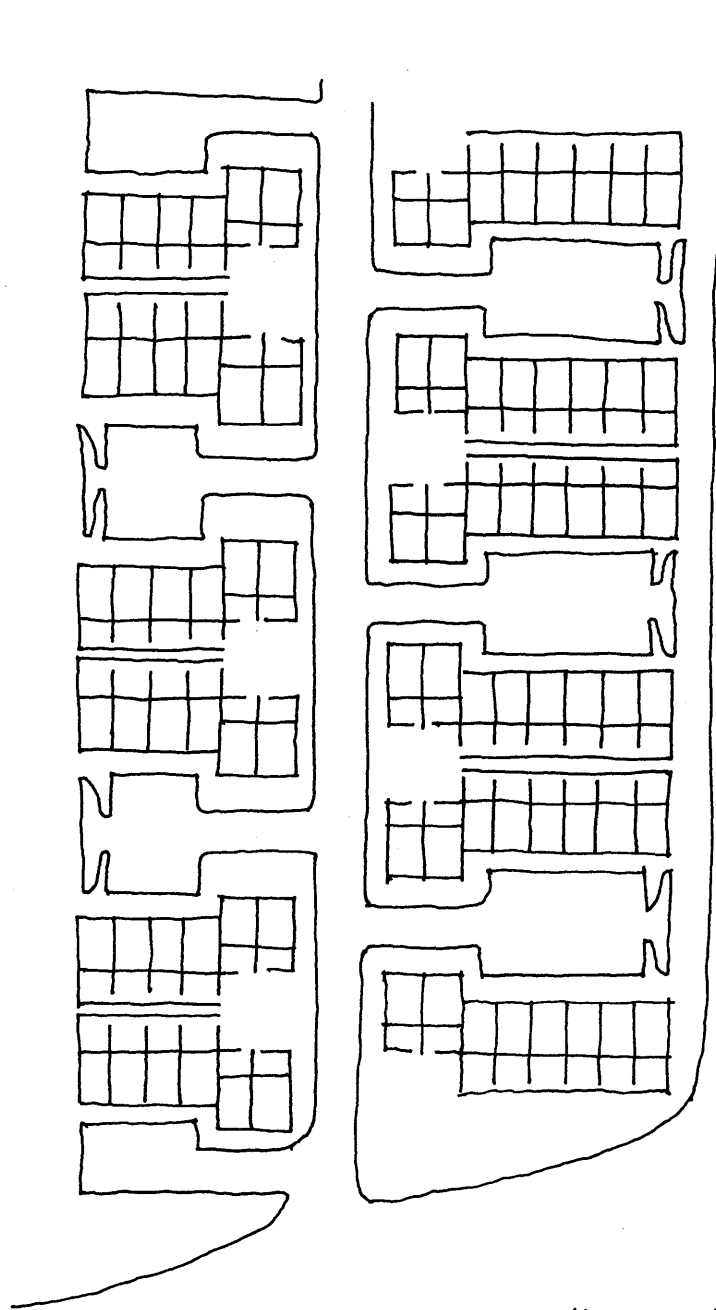


where litter
collects
warren gardens



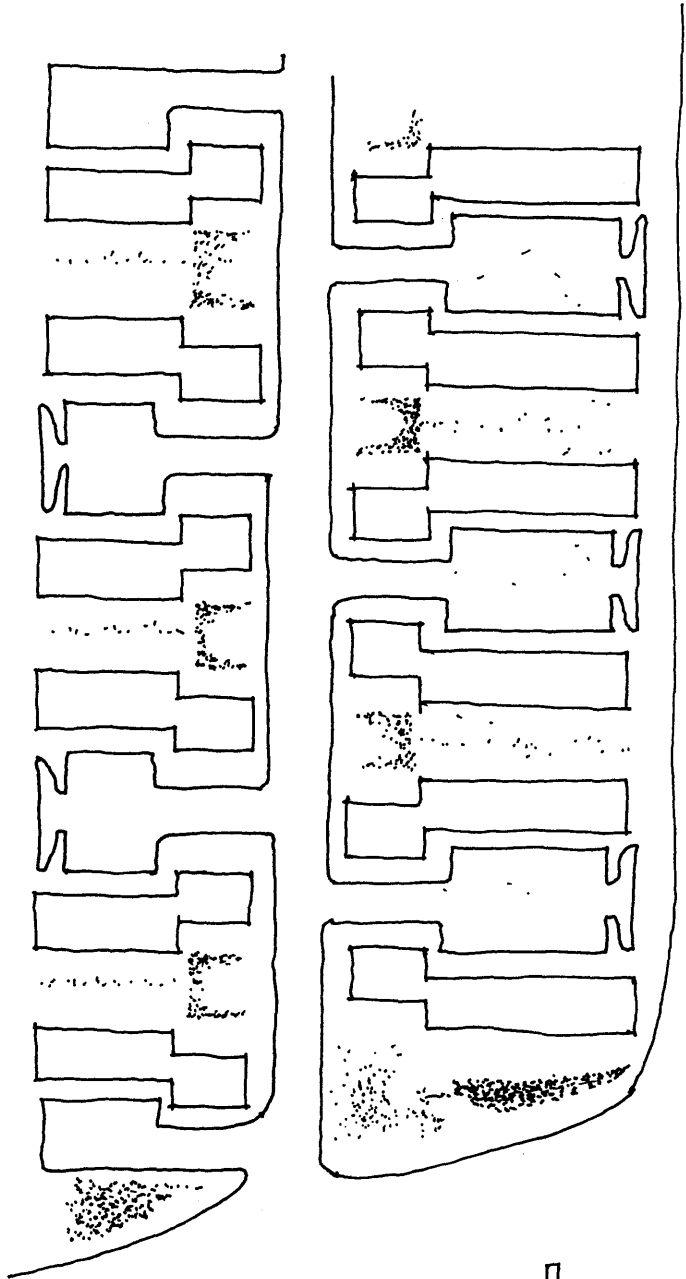
comments

warren gardens

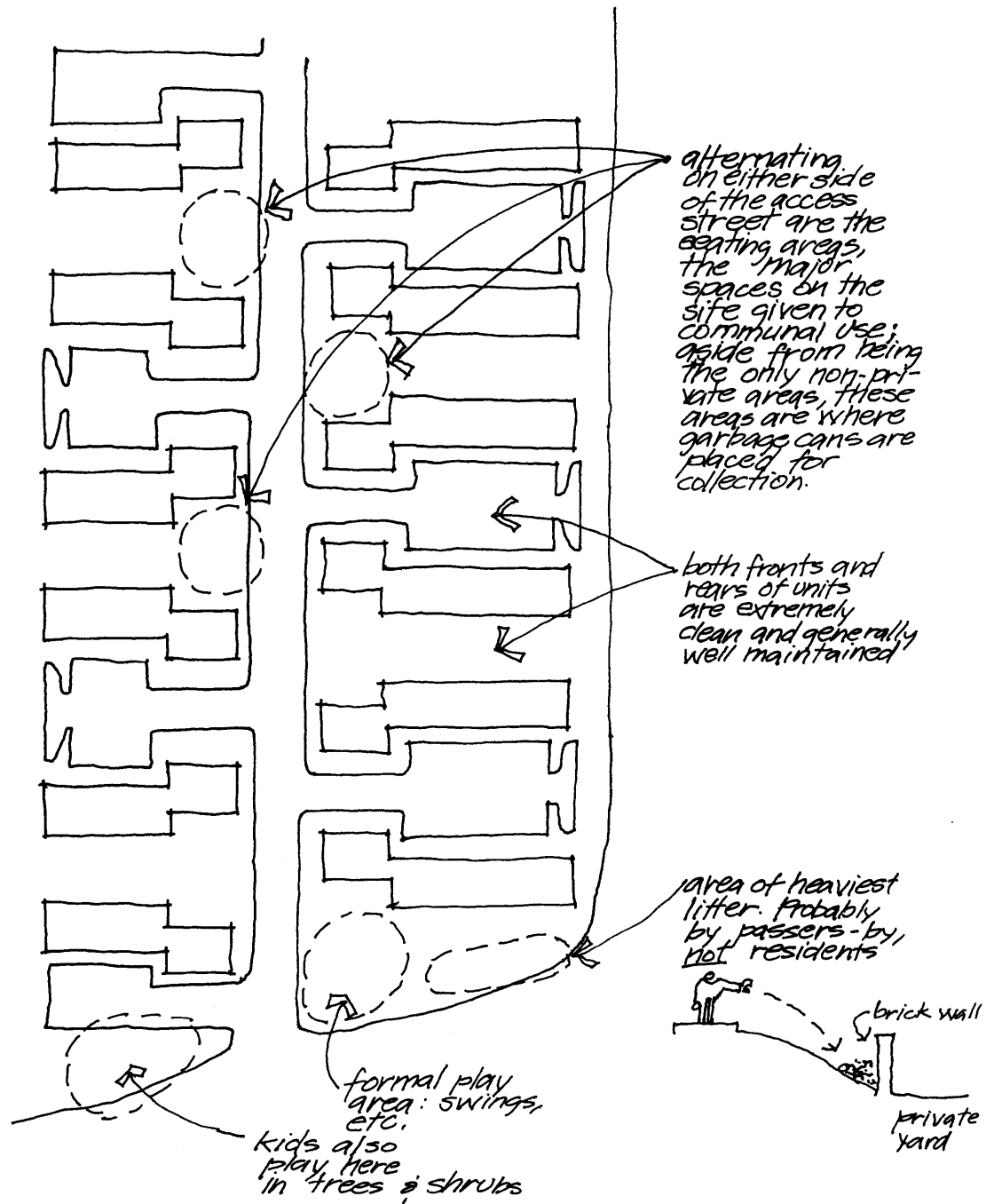


charlame • I
roxbury, mass. (washington park)



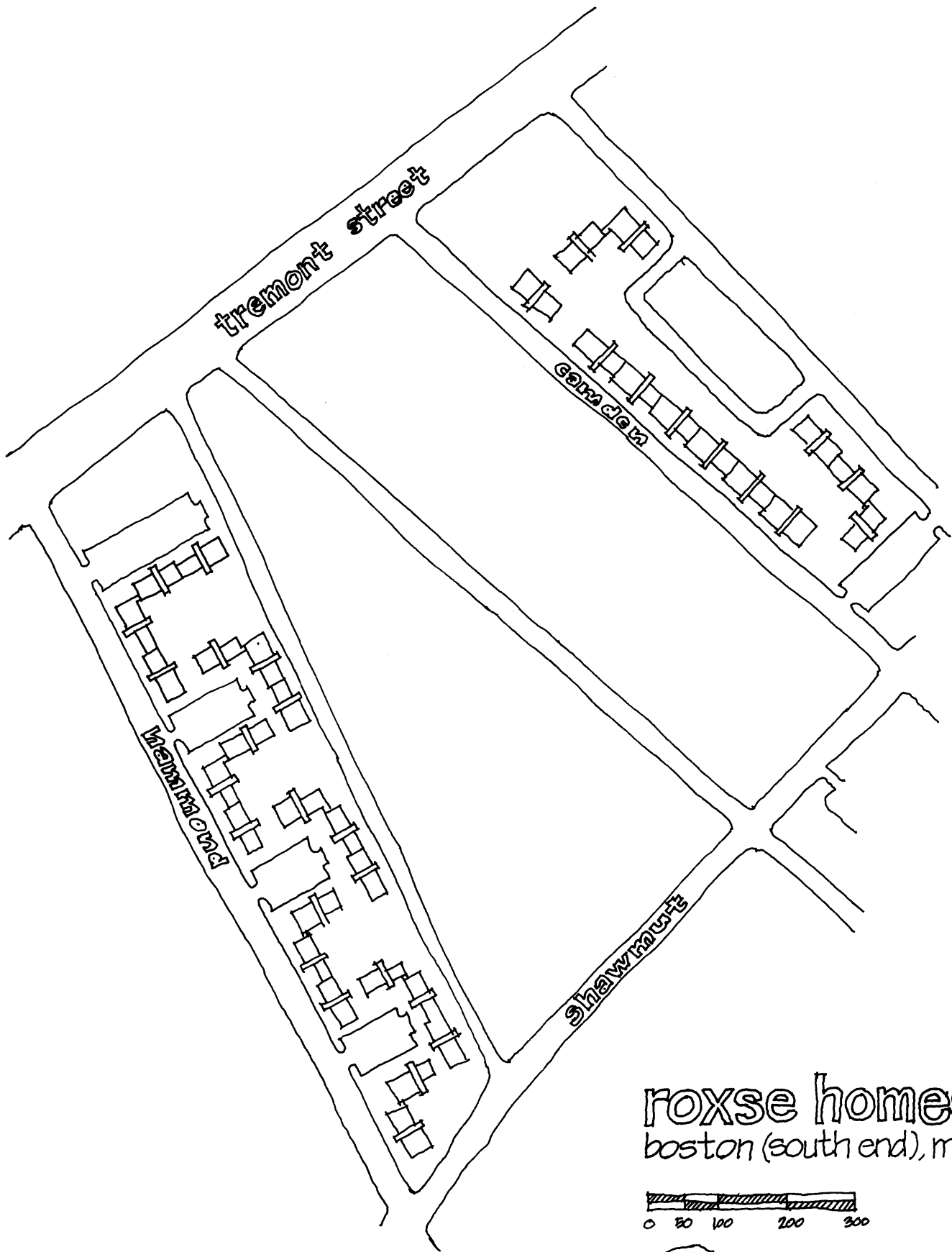


where litter
collects
charlame I

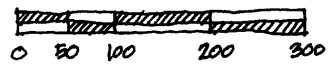


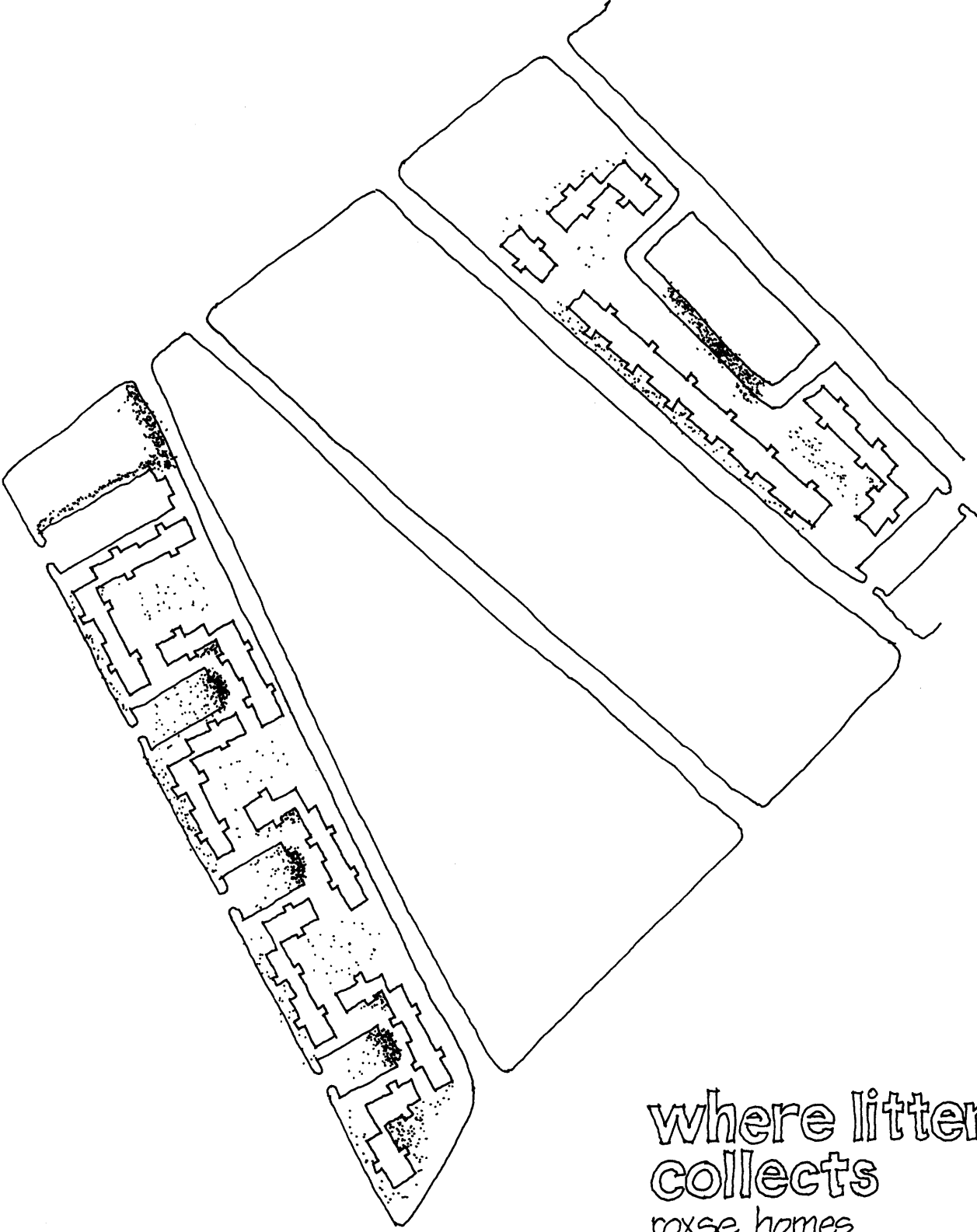
Comments

charlame I

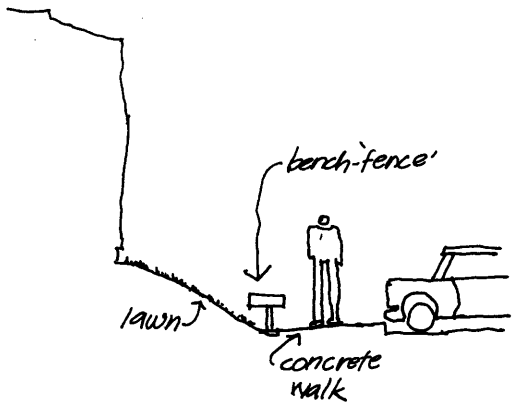


roxse homes
boston (south end), mass.

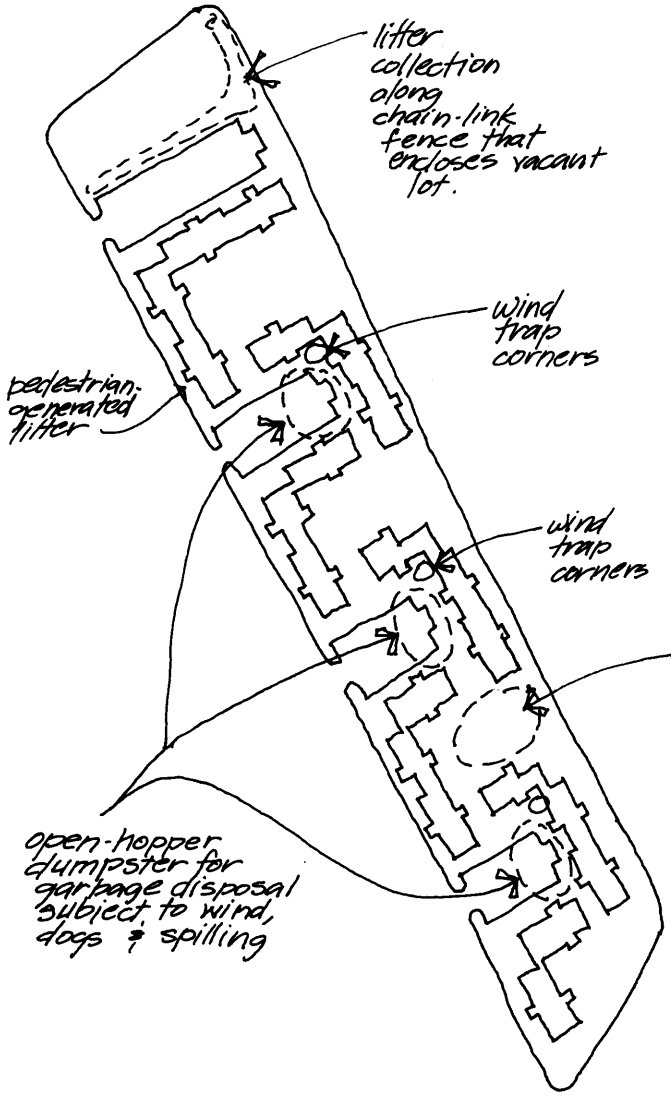
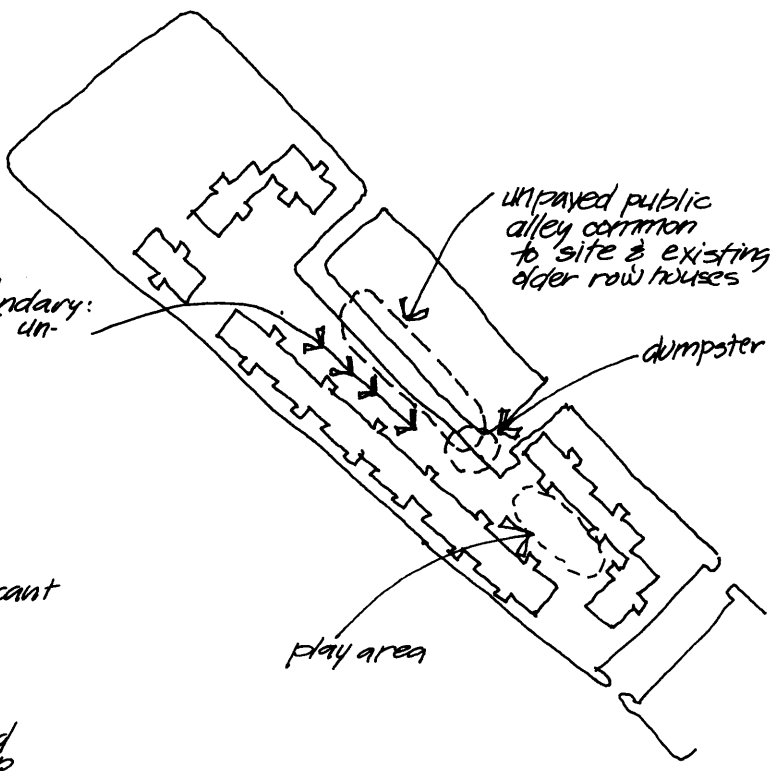




where litter
collects
roxse homes



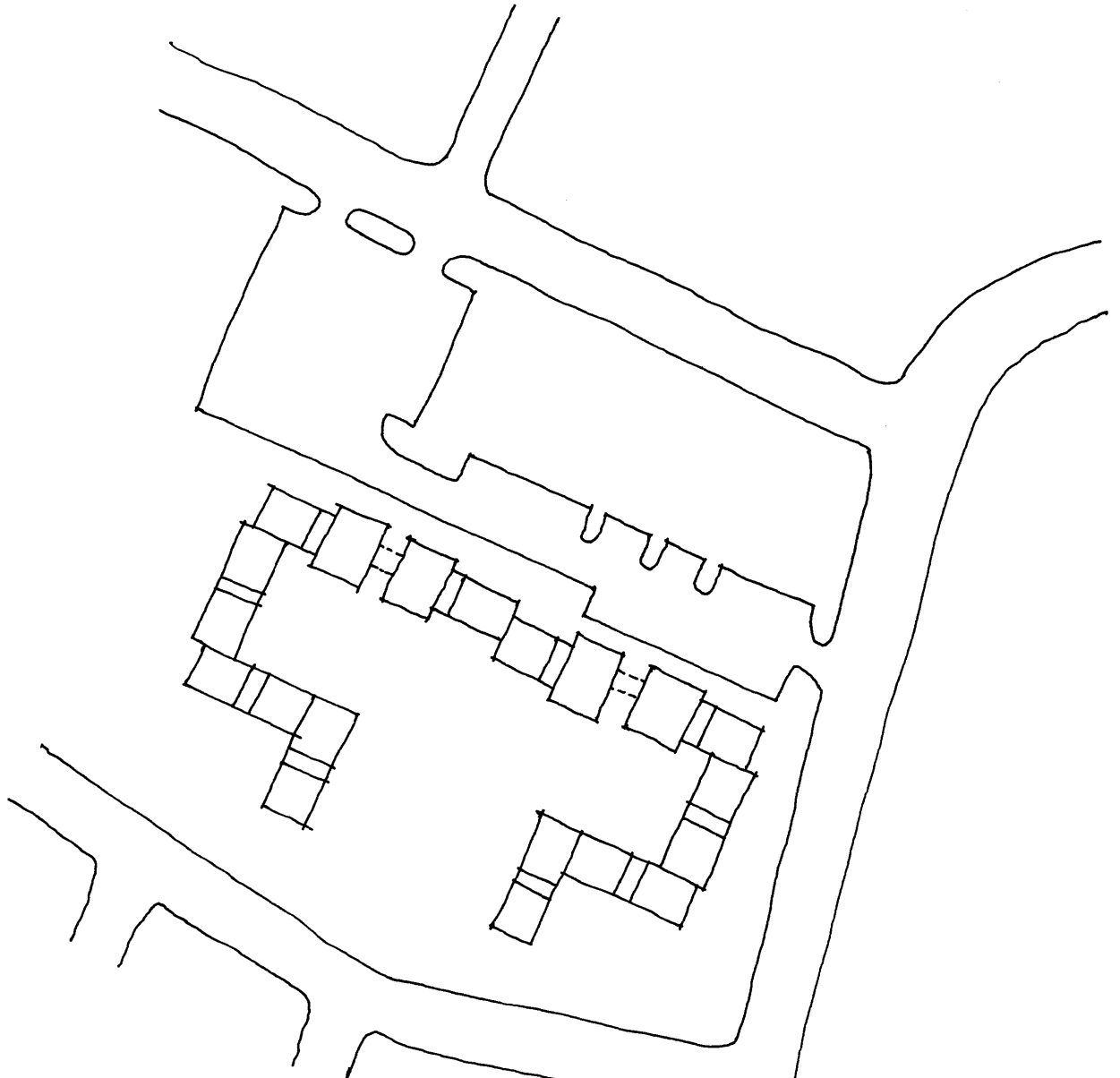
Combination slope-down and bench fence seem to act as a respected boundary: the lawn is un-worn & un-littered



play areas w/ somewhat heavy use: moderately light litter levels
litter containers placed here seem to be used

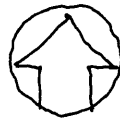
Comments

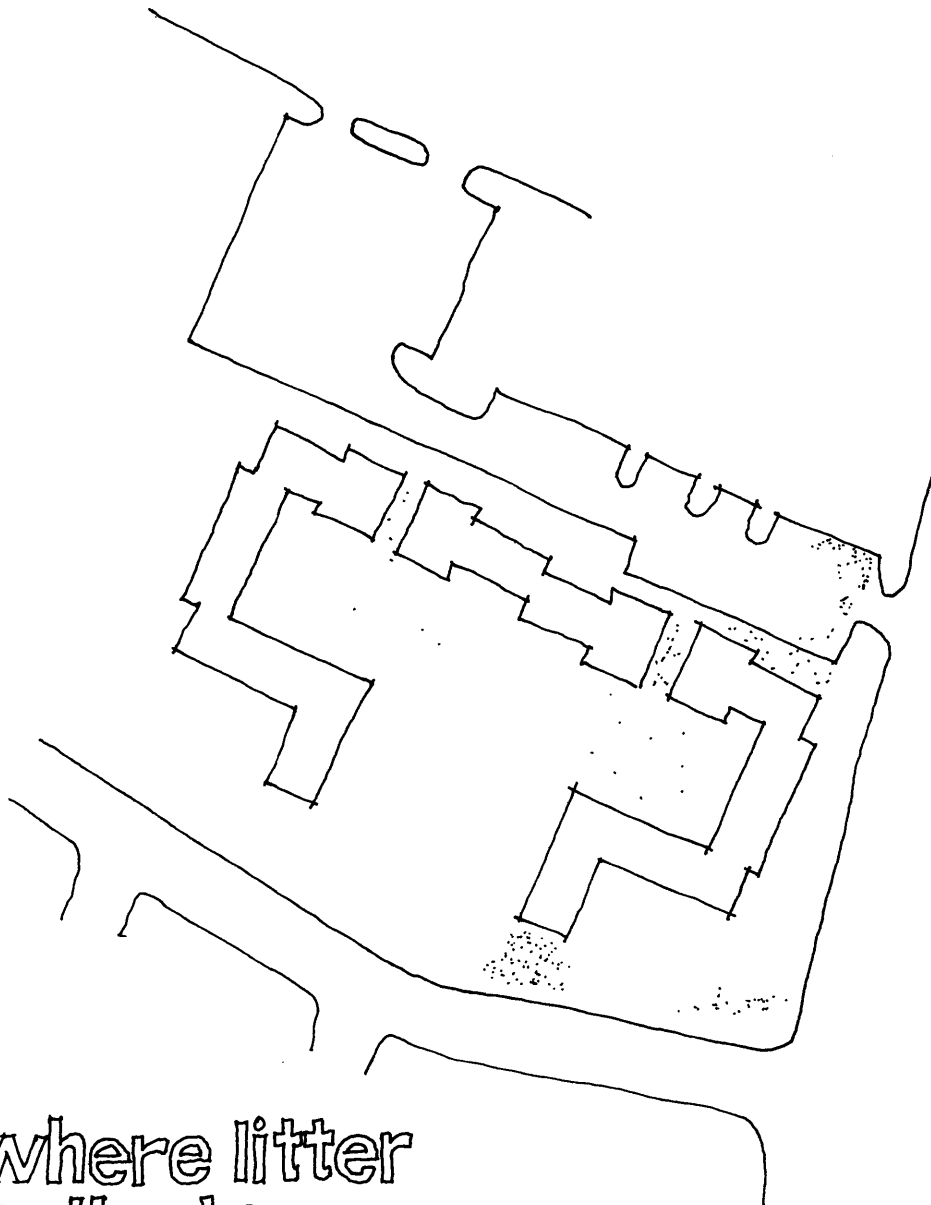
roxse homes



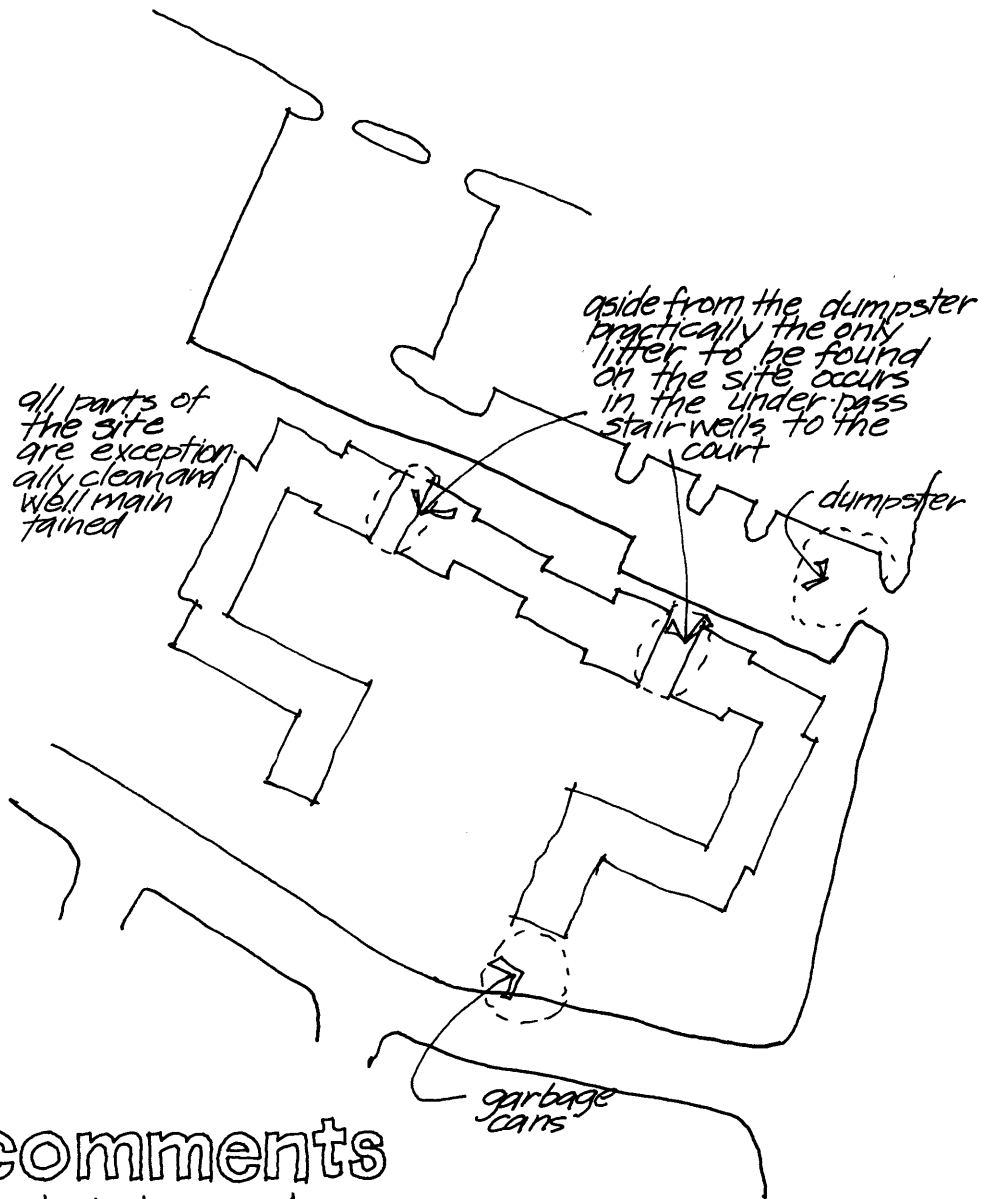
Westminster
Court

roxbury, mass. (Washington park)



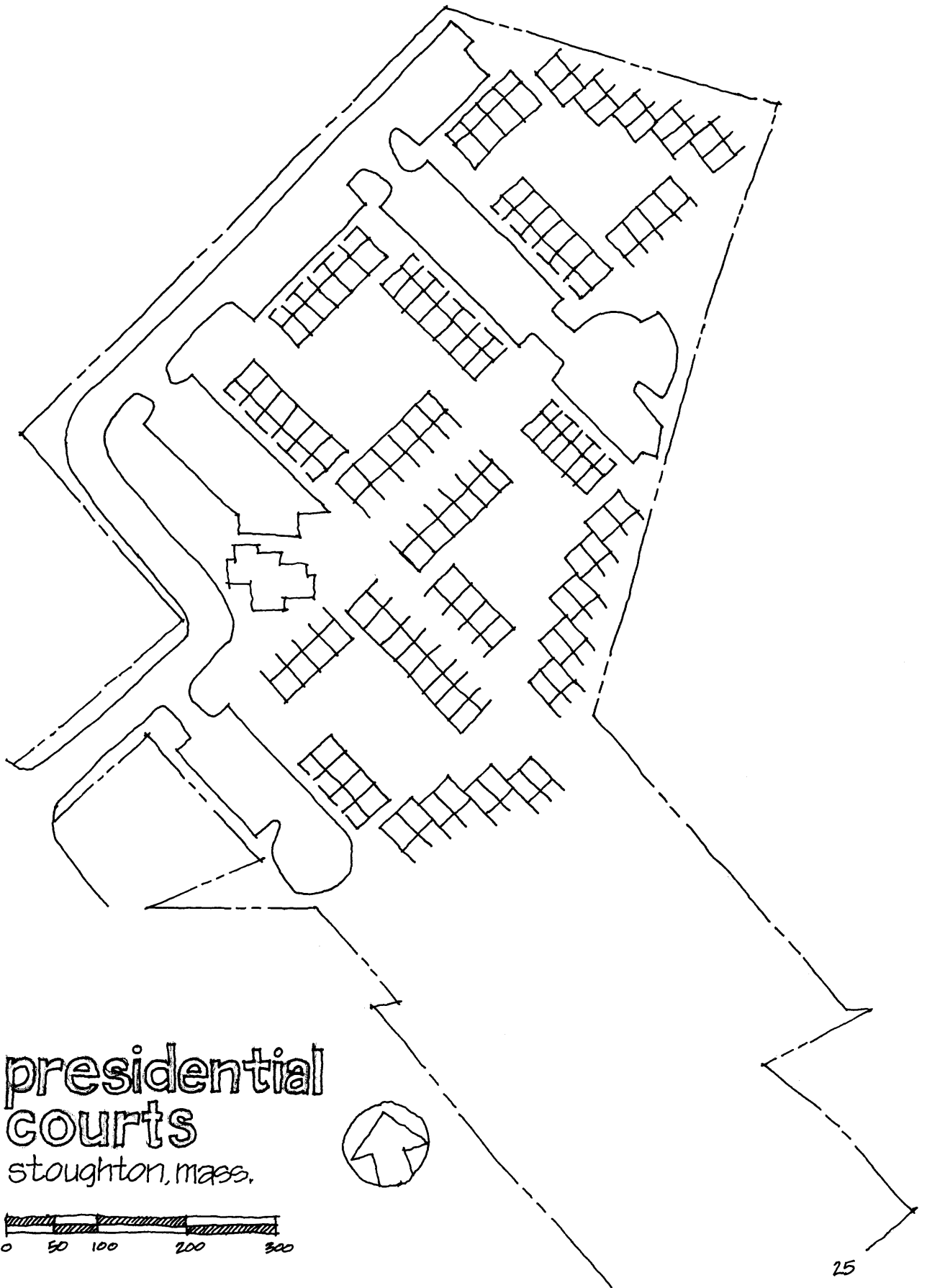


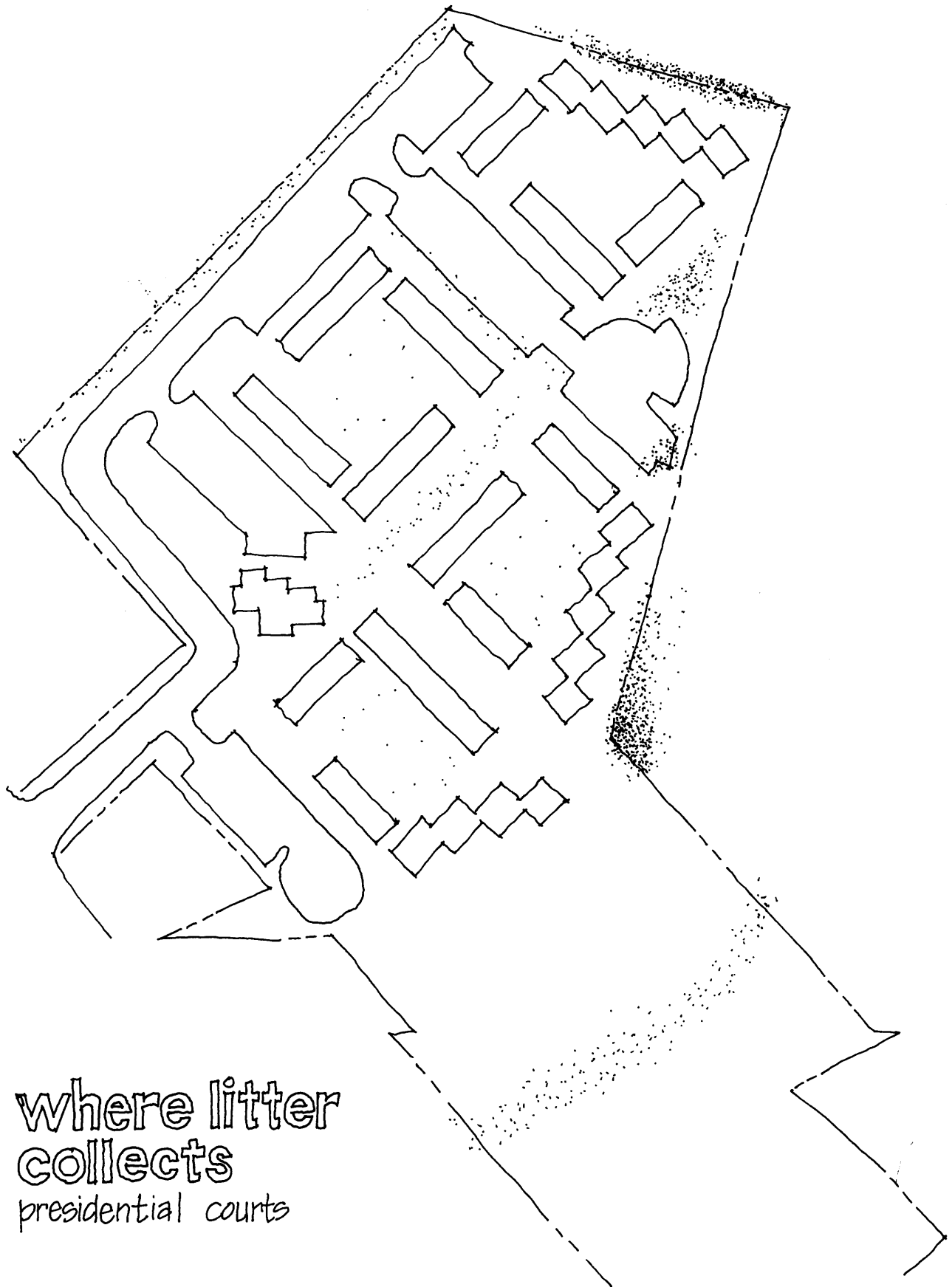
where litter
collects
westminster court



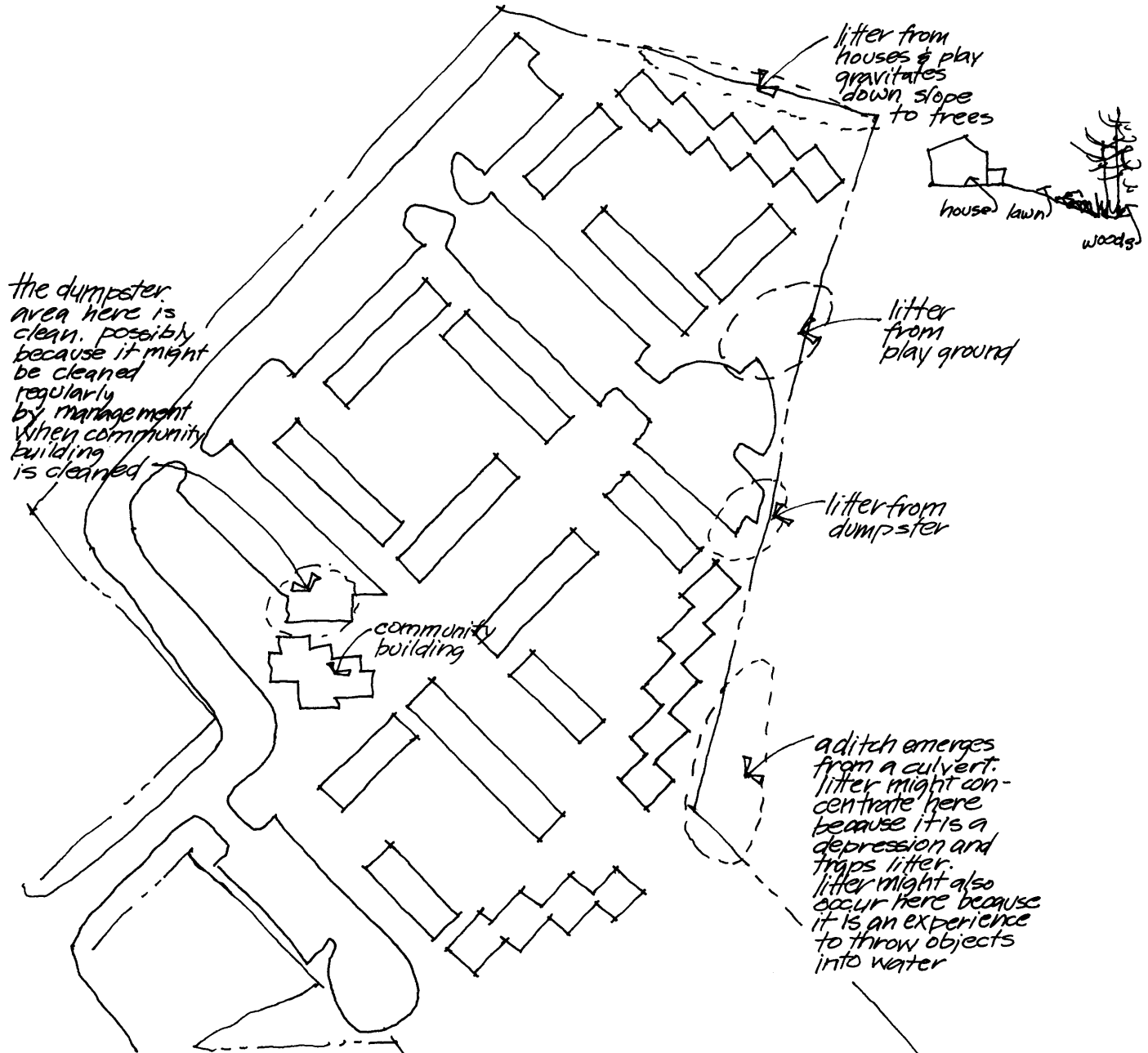
Comments

Westminster court

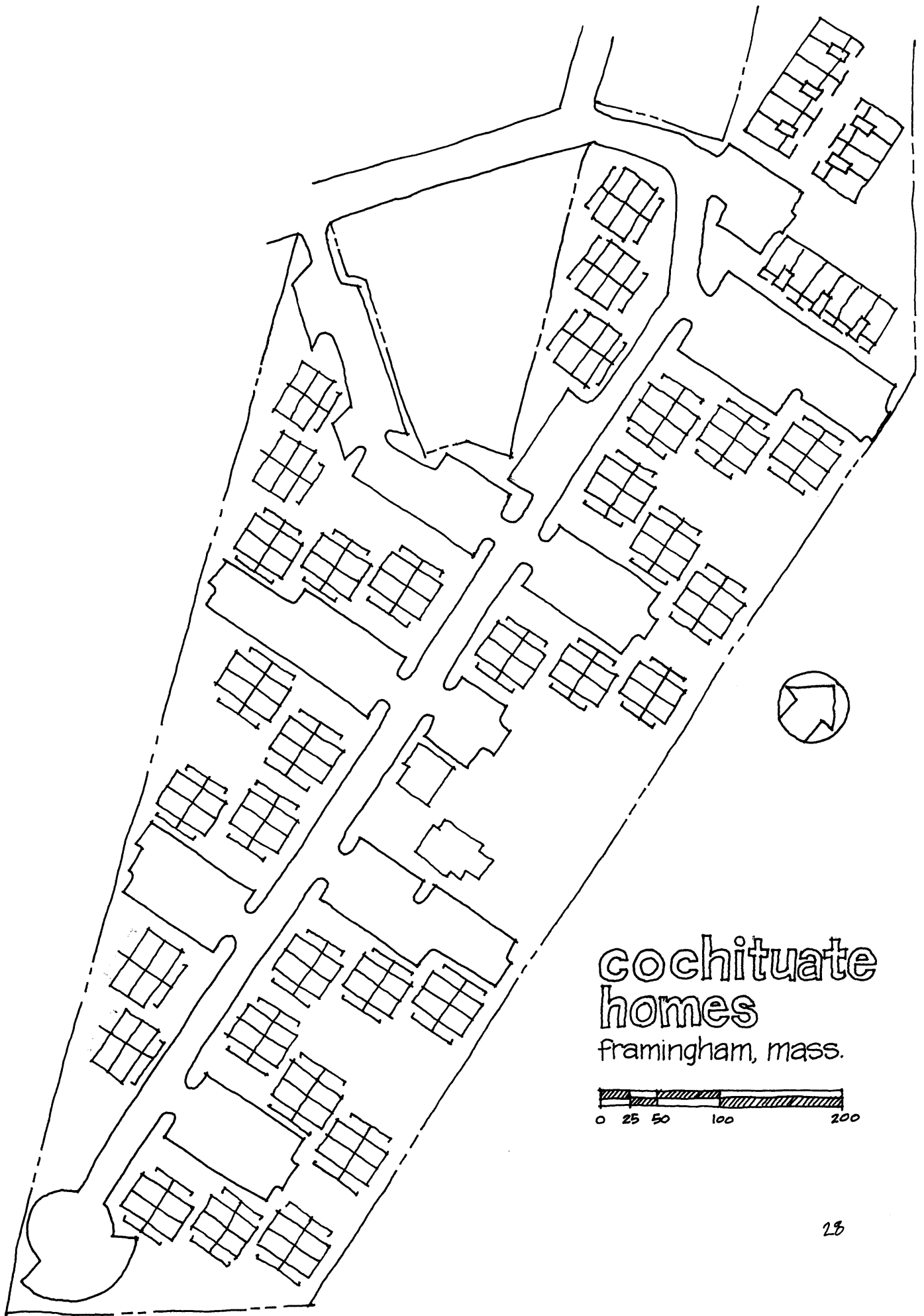




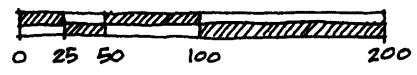
where litter
collects
presidential courts

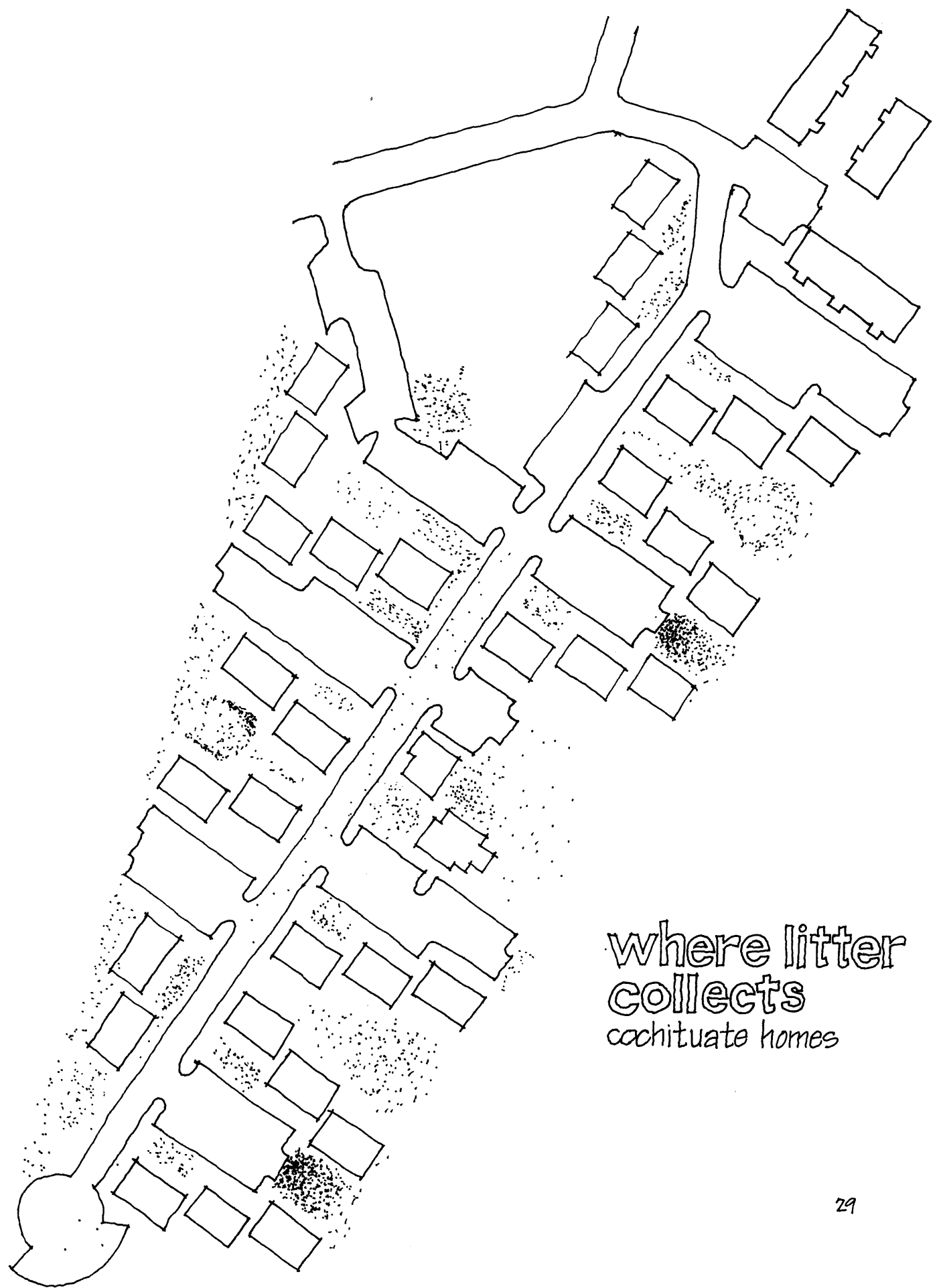


comments
presidential courts

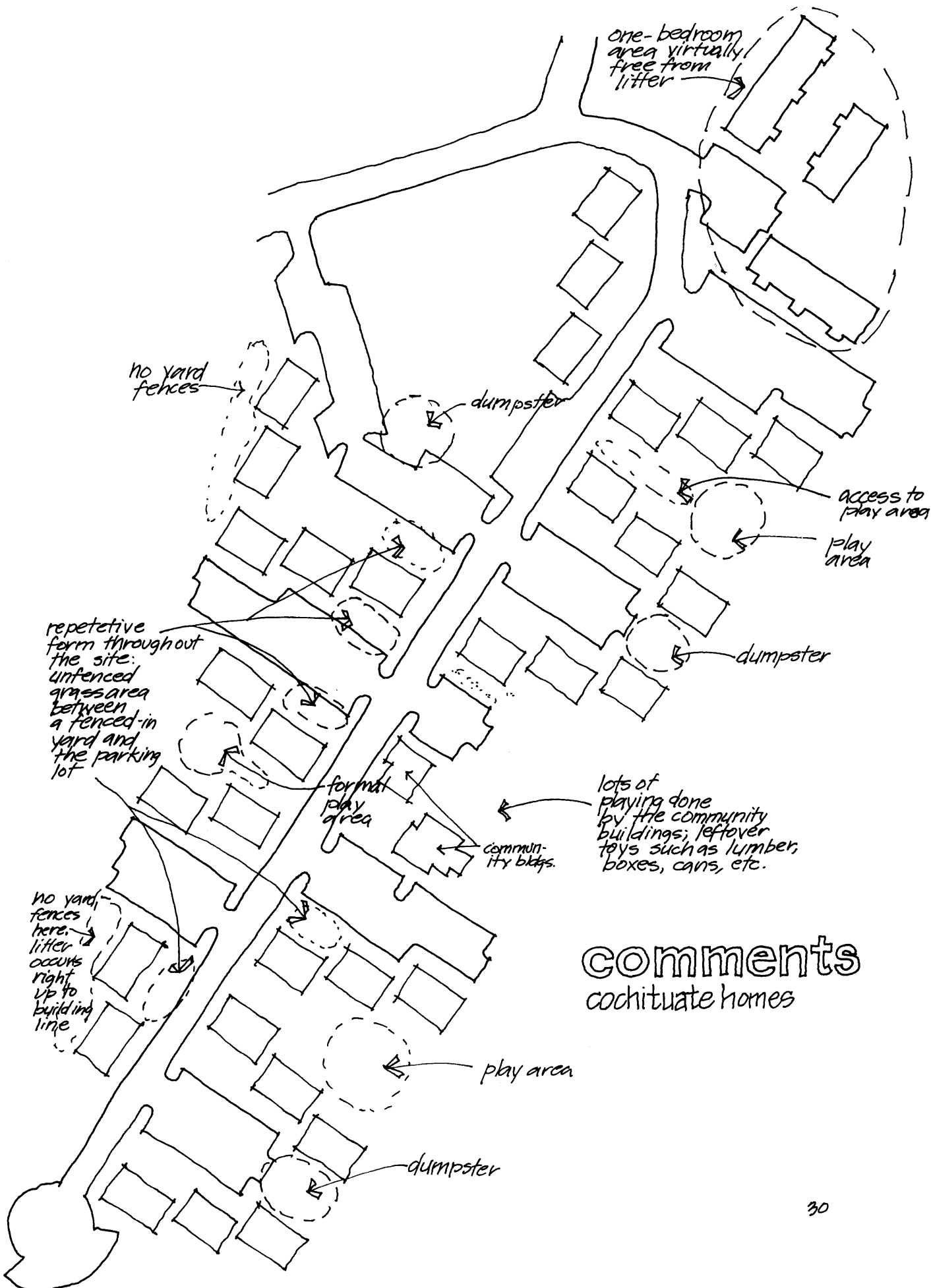


cochituate
homes
framingham, mass.





where litter
collects
cachituate homes



comments

cohousing homes

3. FINDINGS: WHERE LITTER COMES FROM AND WHERE IT GOES

3.1 Describing a Litter Pattern

The purpose of the following section is to describe the "sources" of litter on housing sites explaining where litter comes from and where it generally collects. Contrary to the initial assumption that housing sites become littered because people (residents, supposedly) are tossing and dropping used-up articles throughout the site, the findings indicate that litter is generated primarily as a result of a faulty garbage disposal/collection system. Secondly, litter levels are somewhat proportional to the number of children living on the site and using the outdoor spaces. "Littering"--the random depositing of objects that are not intended to be retrieved or re-used--does take place on the housing sites investigated but has far less impact on the total littered-scene than was initially imagined.

The Formal Garbage Disposal/Collection System

Pattern: Most litter that occurs on housing sites is spilled garbage, not individually dropped objects.

By looking at what type of objects make-up litter on housing sites it was observed that most litter, whether in piles or dispersed over an area, can be placed in a category of Discarded Domestically-Used Articles, or articles that are usually used/consumed within the house. These articles take the form of (1) "bulk" packages--such as half-gallon milk cartons, egg containers, facial tissue boxes, etc., (2) containers for foods that need preparation in a kitchen--such as soup cans, frozen food packages, and eaten grapefruit halves, and (3) used-up or broken household items--such as toilet articles, laundry- and kitchen cleanser containers, etc. Second in quantity are "ambiguous" items, things that

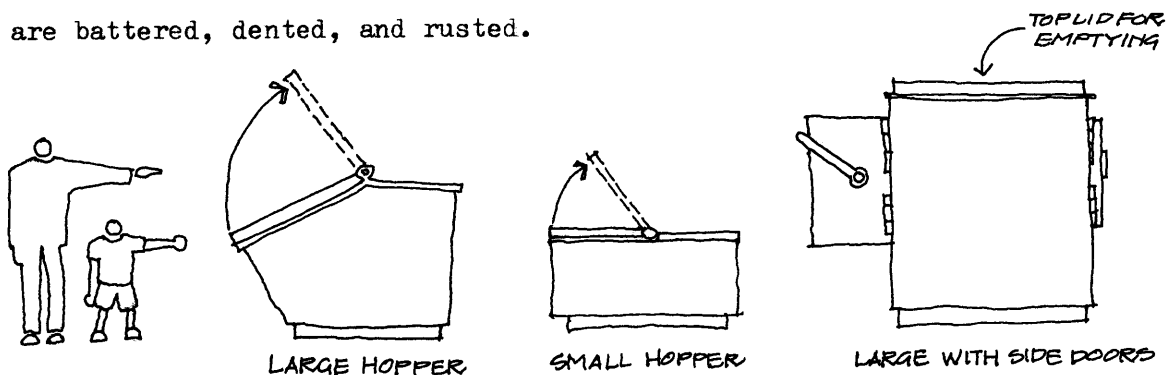
could be either spilled garbage or "litter" (such as soft-drink and beer containers, and letters, papers, and magazines), and third are objects that are "Probably Littered" such as cigarette butts and packages, candy wrappers, and bags, wrappers, and cups from take-out food establishments.

This observation is reinforced by the fact that litter levels tend to be higher near places where garbage is stored and collected, except on sites where there is extremely low levels of litter.

While many possible explanations for the phenomena of garbage-turning-into-litter have been observed, the basic factors that seem to influence these explanations are (1) the design and placement of the storage facility, (2) the level of service and frequency of collection and (3) resident responsibility.

There are basically two types of garbage storage facilities that are used on the sites investigated: centralized dumpsters, used for walk-up apartments and where private companies, rather than municipal service, collects the trash, and individual trash cans, used at the row houses with ground contact where garbage is collected as a municipal service. Of the dumpsters (large steel containers that are mechanically emptied into the collection truck) there are three types: large hoppers (with or without a top lid), small hoppers, and large containers with both a top lid and smaller side doors. Problems in using each of these three types is probably the main explanation for this variation of types. The large hoppers require a large lid (the size of the lid, for emptying purposes, is proportional to the size of the hopper) which because of its weight and height is unwieldy for a person who is simultaneously trying to empty a trash basket into the hopper; consequently, either the trash gets spilled or, as is more often the case, the lid is either left

open or is permanently removed. This leaves the contents of the hopper vulnerable to wind, dogs, and overflow. Such being the case, a smaller, lower hopper would seem to make sense. However of course the capacity is reduced which either results in overflow if service is not frequent enough or it results in having more dumpsters which requires a greater expenditure in time and cost to the collection company and ultimately to the tenant. (It was observed to take around three minutes for a truck to position itself, lift, dump, and return one dumpster in relatively uncrowded conditions. There were two men in the truck.) As a result of these conditions, new hoppers at Cochituate Homes in Framingham are large, heavy-duty structures with a large lid on top for emptying and smaller side doors for the disposal of individual trash. The problem with this unit however is that it is more difficult to horizontally throw trash into a side door than it would be to vertically dump trash into an opening in the top of the container, and such being the case, much trash gets spilled. Also the side doors require closing and latching when the dumpster is being emptied and this again results in a greater expenditure of manpower or time on the part of the collection company. It is also speculated here that in time the container will become broken simply because there are more moving parts (doors, hinges, and latches) on these containers, and dumpsters undergo rough use. Most older dumpsters observed are battered, dented, and rusted.



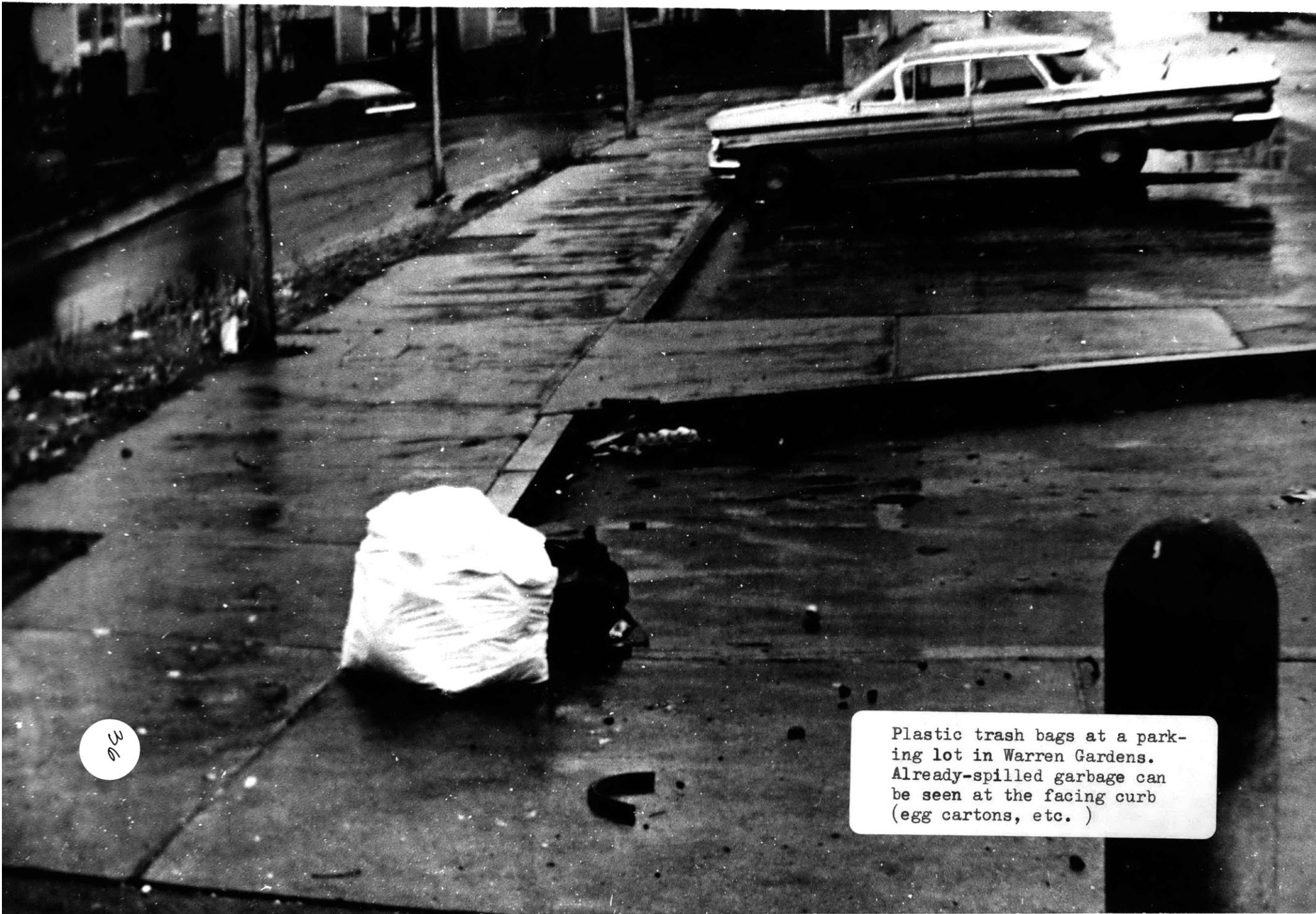


34

Dumpster in the parking lot at Roxse Homes.

35

Highly littered area
around dumpster at Cochitu-
ate Homes. Dumpster is the
dark object at left.



36

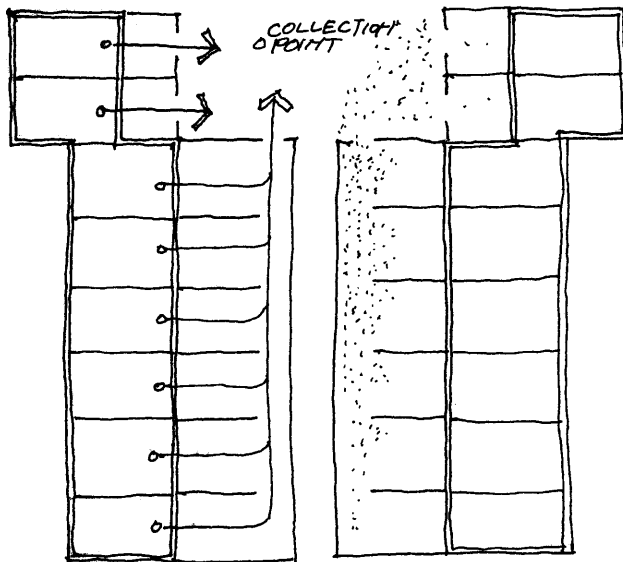
Plastic trash bags at a parking lot in Warren Gardens. Already-spilled garbage can be seen at the facing curb (egg cartons, etc.)

Related problems are also inherent to individual trash containers. There are two types generally in use on the sites investigated: "permanent" metal or plastic garbage cans, and disposable plastic garbage bags. In many cases the garbage cans used are not in good condition: plastic breaks (particularly in cold weather) and metal dents, lids are poor fitting or non-existent. Capacities of course are limited to the number of cans a person is able and willing to purchase, store, and maintain, and such being the case, a common occurrence on garbage collection day is the ever-present overflowing garbage can. The "answer" to this situation is the disposable plastic garbage bag which is easy to store (folds), cheap (?), and has unlimited capacity--providing a household has unlimited bags. But the problems with these bags stem from their tendency to tear, either caused internally by heavy or pointed objects or caused externally by rough handling (by both the resident and collector) or by dogs.

The impact of dogs cannot be minimized. At Warren Gardens where there is a relatively high number of resident-owned dogs (despite rules against such) there is also a corresponding high incidence of upset garbage cans and torn bags, while at other sites where no dogs were observed, trash containers remain relatively free from disturbance. Parenthetically, there is also a rough correlation between the amount of dog feces seen on a site and the amount of garbage-generated litter, although this may be due to clean-up patterns rather than being a direct cause-effect relationship.

While the foregoing describes some of the factors of the design of trash containers that contribute to litter levels, another aspect that seems to be influential in the production of litter is the placement and location of the container, whether it be a dumpster or a trash can.

The observations are that the longer the distance between the dwelling unit and the collection point the more likely it will be that garbage will be spilled. (See diagram below.)



PATH OF GARBAGE CANS FROM UNIT TO COLLECTION POINT.

DISPERSAL OF LITTER ON GARBAGE COLLECTION DAY (EXAGGERATED)

At Charlamé I (ROXBURY) the path is confined by fences from the dwelling unit to the collection point. On a garbage collection day, observable litter levels increase as the path nears the collection point-- caused by most people using the path at this point.

This observation however is modified somewhat by some planning considerations, namely, whether this path from dwelling unit to collection point travels through private, communal, or public space, and whether the collection point itself is basically in public or private space. For example the observation at Charlamé is possible because litter levels are light--not much is spilled--and it would be difficult to observe this if, say, the first unit on the path spilled a lot at that unit. It is assumed that less spilling takes place here primarily because the path is essentially in private yards, even though the path is communal. In addition, the yards and path are cleaned regularly (the other reason it is possible to observe the phenomenon on garbage collection day) and one feels the violation of turf in an essentially clean place.

Aside from the aspect of container design and placement, the other major factor contributing to garbage litter is the level of service and frequency of collection. Naturally, even ease-of-use of a dumpster will make little difference if the dumpster frequently overflows because there is no match between the rate at which garbage is generated and the rate at which it is carried away. Similarly, extreme caution when depositing household trash makes little sense to a resident when the trash will be spilled anyway by the collector. There are other implications however when service is irregular or poorly executed. For example, garbage containers remain at curbside for hours and sometimes days before being emptied. This time-lag between deposit and collection leaves the cans and bags vulnerable to dogs and other scavengers for a long period of time with the result being upset cans and torn bags. In addition much damage is done to permanent containers either directly or indirectly by the garbage man through rough handling and misplacement of cans and lids. Several can lids have been observed crushed or flattened by cars because the lids have been placed in the street or parking lot rather than back on the curb.

Finally, a few words about resident attitudes. It is probably reasonable to assume that if the prevailing resident attitude is one of respect and "cleanliness" toward the outdoor environment, that garbage will not get spilled by the resident, and that garbage that does get spilled will get picked-up, regardless of inefficiencies of the collection system. However, in light of the observations mentioned above, it is probably equally as reasonable to assume that respect for an efficient, dependable system is an integral part of- and goes a long way in fostering respect for that total environment.

Play Leftovers: The Impact of Children

Pattern: Litter is likely to occur where children collect, play, and travel.

Perhaps it is safe to say that children spend more time than any other age group in the open-spaces of housing sites. This alone may be the major contributing factor explaining why a large amount of litter found on housing sites can be attributable to children. Of product-packages alone that can be found on housing sites, an abundance of "children-market" items can be identified. For example, the following probable-child-consumed items were found in and nearby one twenty-car parking lot: two penny-candy bags with wrappers inside (one, apparently accidentally dropped, with candy still inside), a Twinkies (a cake) wrapper, some ice cream wrappers and sticks, and Razzles (chewing gum) packages--three found in a four foot radius. In addition, elementary school papers can be found in some quantity. But aside from spilled garbage, the objects most visible on housing sites are abandoned toys. Of these there are two distinct types: broken or lost "formal" toys (purchased) and informal, found objects like boxes, cans milk crates, boards, and kitchen utensils. Broken formal toys are usually of a smaller scale than the informal toys and tend to be recycled/reclaimed/moved-about more readily. On four consecutive days the path was traced of a red and yellow plastic racing car approximately 16" long with missing wheels. The car appeared in the same location (untouched?) for the first two days. On the third day after a brief search it was located some 200 feet away, and on the fourth day it couldn't be found. Informal toys on the other hand tend to be more communal and more stationary--left around to return to another day or for another to use or maybe simply to return to the state by which it was



Left-over toys at a grassy play area on a housing site near Fort Hill (Roxbury)

42

Litter concentrations near a
formal play area at Cochituate
Homes, Framingham.

found.

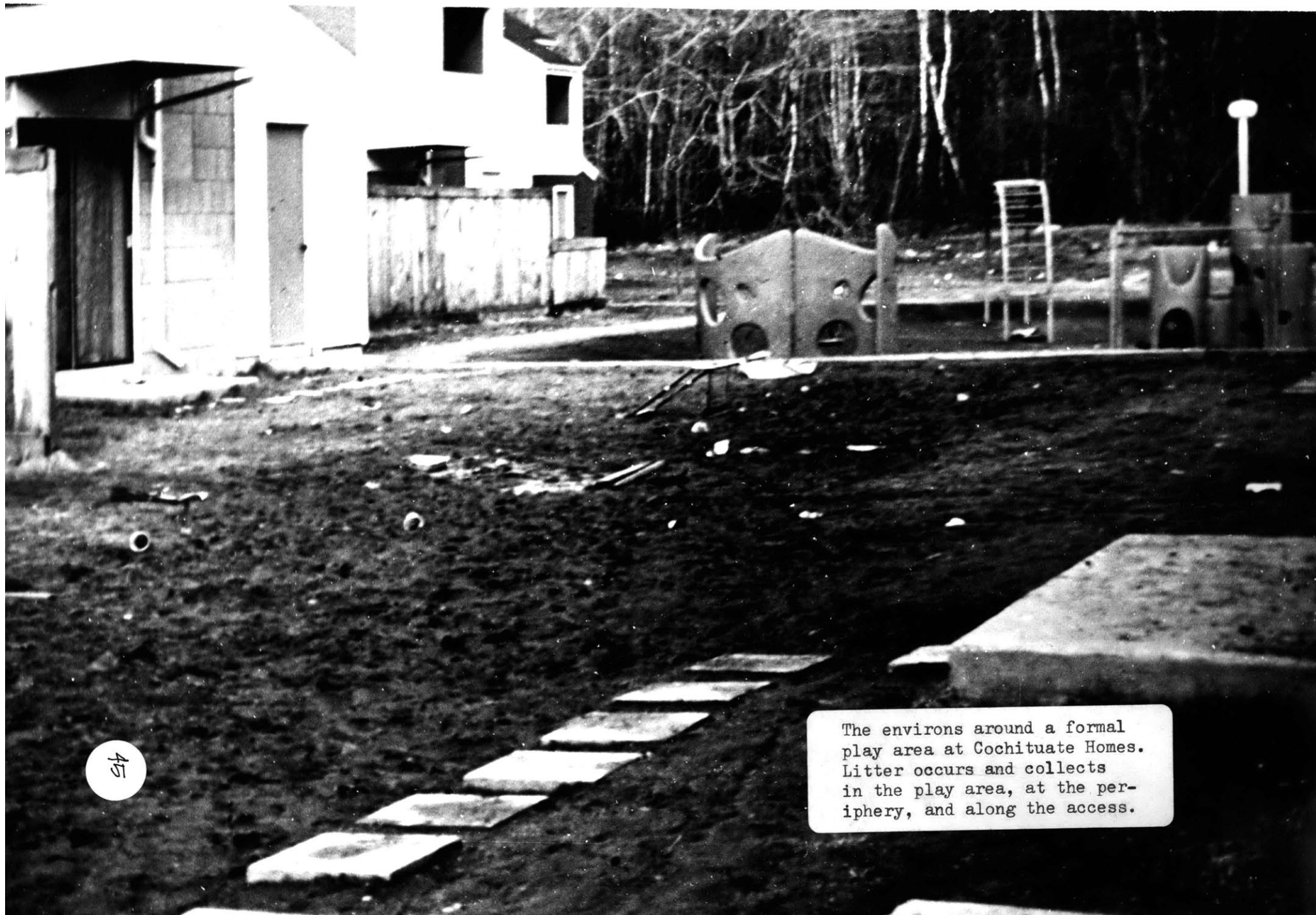
Children seem to be less discriminatory than adults as to where they litter. Very little of the litter is hidden or deliberately placed, instead it seems to occur wherever the children might be. On heavily-littered sites it is even possible to accurately predict the general locations of child gathering and play when the children are not around (late hours or during school) by looking at where child-generated litter occurs. For example, formal play areas and parking lots at Cochituate Homes are more heavily littered with childrens objects than are seating areas and peripheral grass areas.

The impact of children on litter levels is also evident when one looks at the fromal garbage collection system. To begin with, by numbers alone, a family with children produces more garbage than do couples and singles. The problem is amplified when the domestic-garbage-responsibility is shared by members of the family with varying levels of maturity and "expertise" in dumping garbage into a dumpster. This situation is exemplified at Cochituate Homes where the family types are quasi-segregated by location. One-bedroom units (couples and singles) occupy one part of the site with larger units (families) occupying the rest. The amount of litter found around the dumpster in the one-bedroom area is substantially less (almost none) than the amount found around the dumpster in the family area.

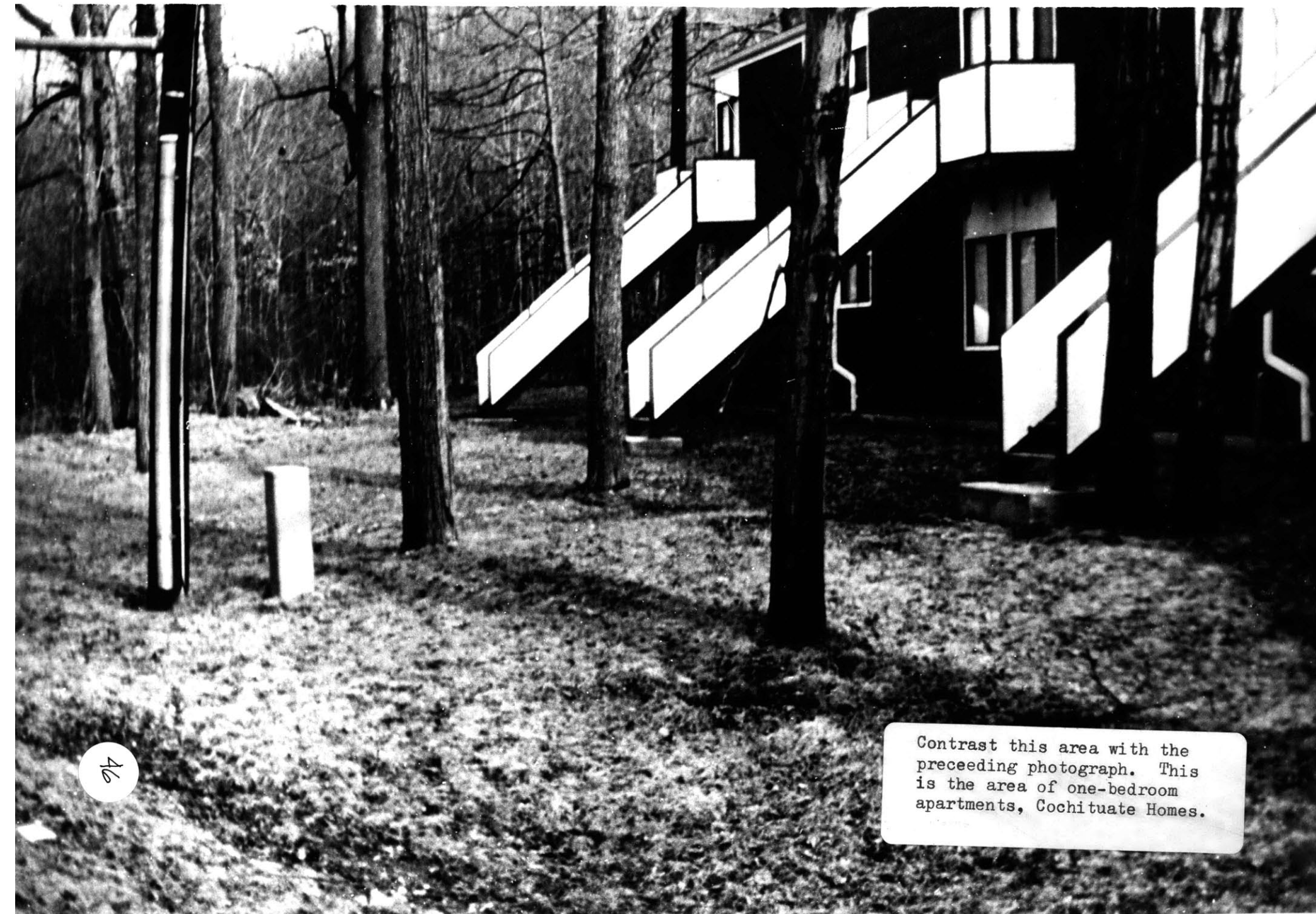
This situation of family-type segregation also provides some strong evidence of the impact of children on maintenance requirements. In the family area the litter level is high (compared even to inner-city sites), grass in many areas is worn away and replaced by mud, many fences are broken, some of the lighting fixtures are marred and loose from the

anchoring. By contrast (again, on the same site) the one-bedroom area is virtually litter-free, paint/surfaces/materials are still bright and new, and the grass in the area is thick and uniformly cropped.

At a larger scale, this phenomenon is also observable by comparing the sites examined. Charlame and particularly Westminster Court are projects with smaller (one- and two-bedroom) units, a corresponding fewer number of children, and observable lower litter levels than the other projects. Cochituate Homes and Warren Gardens probably have the largest number of children/acre because of dwelling size and because one can see them on a good afternoon playing outdoors--and also the highest level of litter.

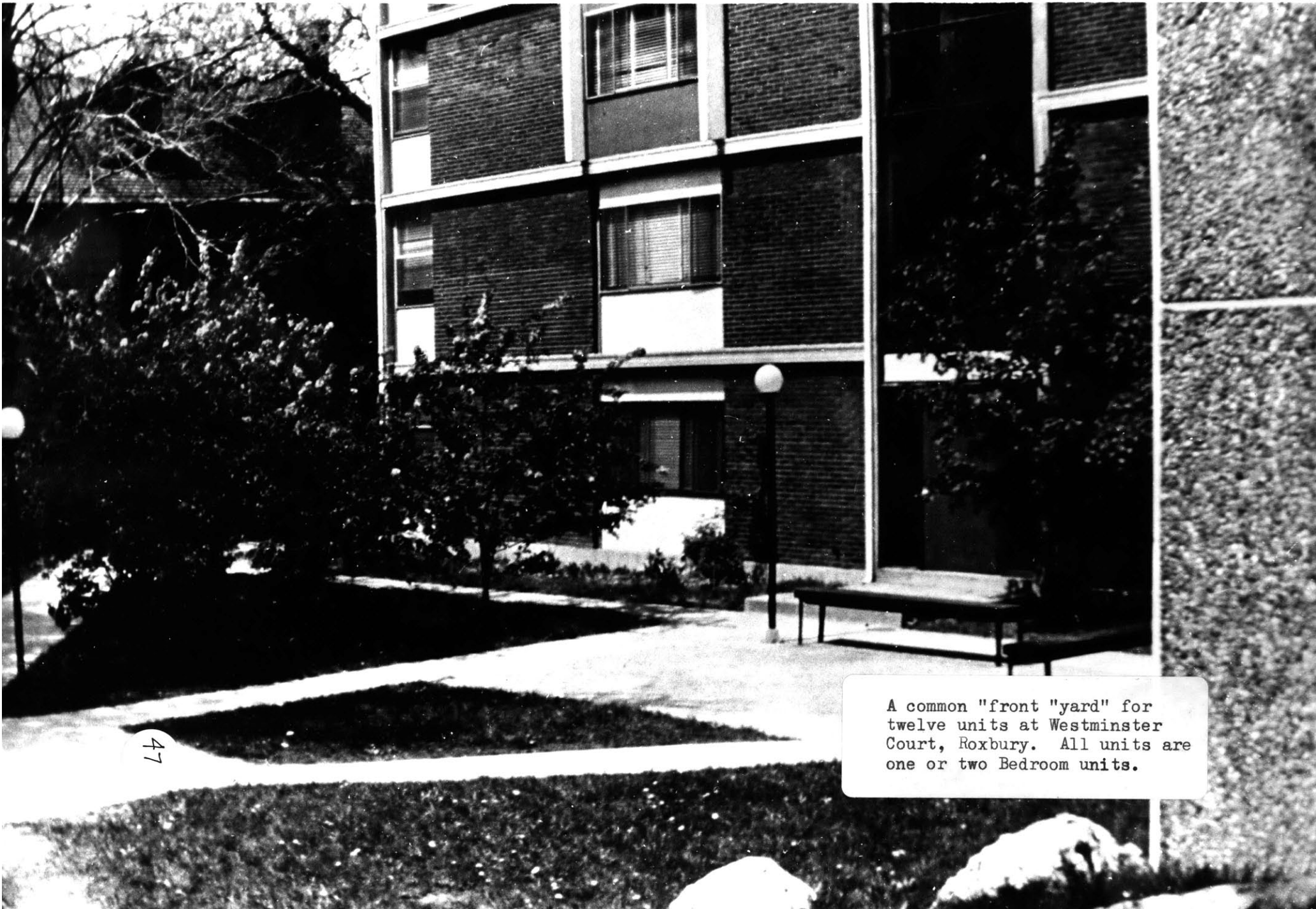


The environs around a formal play area at Cochituate Homes. Litter occurs and collects in the play area, at the periphery, and along the access.



46

Contrast this area with the preceding photograph. This is the area of one-bedroom apartments, Cochituate Homes.



A common "front yard" for twelve units at Westminster Court, Roxbury. All units are one or two Bedroom units.

The Litterer

Pattern: For age groups other than young children, the tendency is to litter only when "proper" disposal is inconvenient or not available.

While littering (as opposed to spilling garbage) does not happen on housing sites as much as initially imagined by this study, it does happen. However, the amount of littered objects varies from site to site and from place to place on the same site: can this variation be accounted for?

There are two factors which are felt to be important when considering this question: (1) people resist the idea of living in their own waste and/or (2) people realize/imagine that the general ethics of a residential area are against littering and they respect/fear these "ethics". These two factors (assumptions) are supported by the following observations.

Litter containers, when they exist on the site, are used. Such containers have been placed on the sites at Roxse Homes and Cochituate Homes and are filled continuously with objects such as newspapers, soft-drink and beer cans, and small (not grocery) bags. Also found in these containers are objects like twigs and old, weathered papers which might tend to indicate that these cans are used for clean-up rather than litter disposal, however some potential litterers (people with recently used-up objects in hand) have been observed using the containers for disposal. Also, if the container becomes filled and not emptied, litter will accumulate around the can.

Casual littering seems to take place where there is other litter present. Identifiable littered-objects tend to occur in greater amounts where there is also the presence of spilled garbage, giving rise to a theory of a "multiplicity" factor for "initial" litter on the site. The assumption here is that it is more "acceptable" to litter where litter

already exists. (Cigarette butts, presumably because of their relatively unobtrusive size and color, seem to be "acceptable" most anywhere.)

Littering also seems to take place where the littered object will not be generally seen: behind walls, under benches and stoops, and in shrubbery. From the Orange Line elevated MBTA train one can see flat rooves that are totally covered with bottles, broken glass, cans, and (yes!) shoes and clothing, but the area is concealed by the parapet and totally invisible from ground level.

Finally, litterers seem to litter if there is no danger that the objects will be dispersed around the area by wind or kicking and in places where it is known that an institution (as opposed to an individual) will in time clean it up. Large objects such as kitchen appliances, old mattresses, and automobiles will not be inadvertently moved about and will in time be removed by somebody with "means" (a truck). Smaller, traditional litter will occur in small fenced-in places of an institutional nature (like a fenced-in electrical transformer) or places like outdoor stairwells.

50

A fenced-in electrical transformer at Canfield Gardens, South End. Litter is thrown in while outside areas are relatively litter-free



51

Discarded mattress placed in ambiguous turf (non-private area) at Cochituate Homes, Framingham.

Site Details That Collect Litter

Pattern: Litter is dynamic. After initial deposit, it will tend to move horizontally along the ground and "gravitate" downward until it is trapped.

There are a number of forces that act on litter to keep it moving until sufficient forces act on it to keep it stationary. The forces that act to move litter are wind, gravity, and muscular (human and other animal) energy. The forces that act on litter to keep it stationary are friction, inertia, and gravity. There are sufficient variations of site characteristics and furniture to insure that litter will move about the site and collect (with other litter) in concentrated areas. The following observations are examples of physical situations where the forces that keep litter from moving are greater than the forces that attempt to move the litter.

The surface material upon which litter rests has been observed to determine the future mobility of litter. Grassy or unpaved areas due to their more irregular surface area and consequent higher coefficient of friction for light objects keep litter in place more than hard paved areas. This may also be due to the conditions that make hard-paved areas places of higher pedestrian and vehicular traffic and thus fewer forces act to move litter.

Gravity is also a major mover and collector of litter. Litter will tend to move in a downward direction, down slopes, stairs, sharp drops, etc. until in order to move further it must move upward. Exterior stairwells and other similar depressions in the site are examples of this. Litter levels on some relatively unobstructed hills tend to be higher at the bottom of the hill even though the litter is generated at the top.

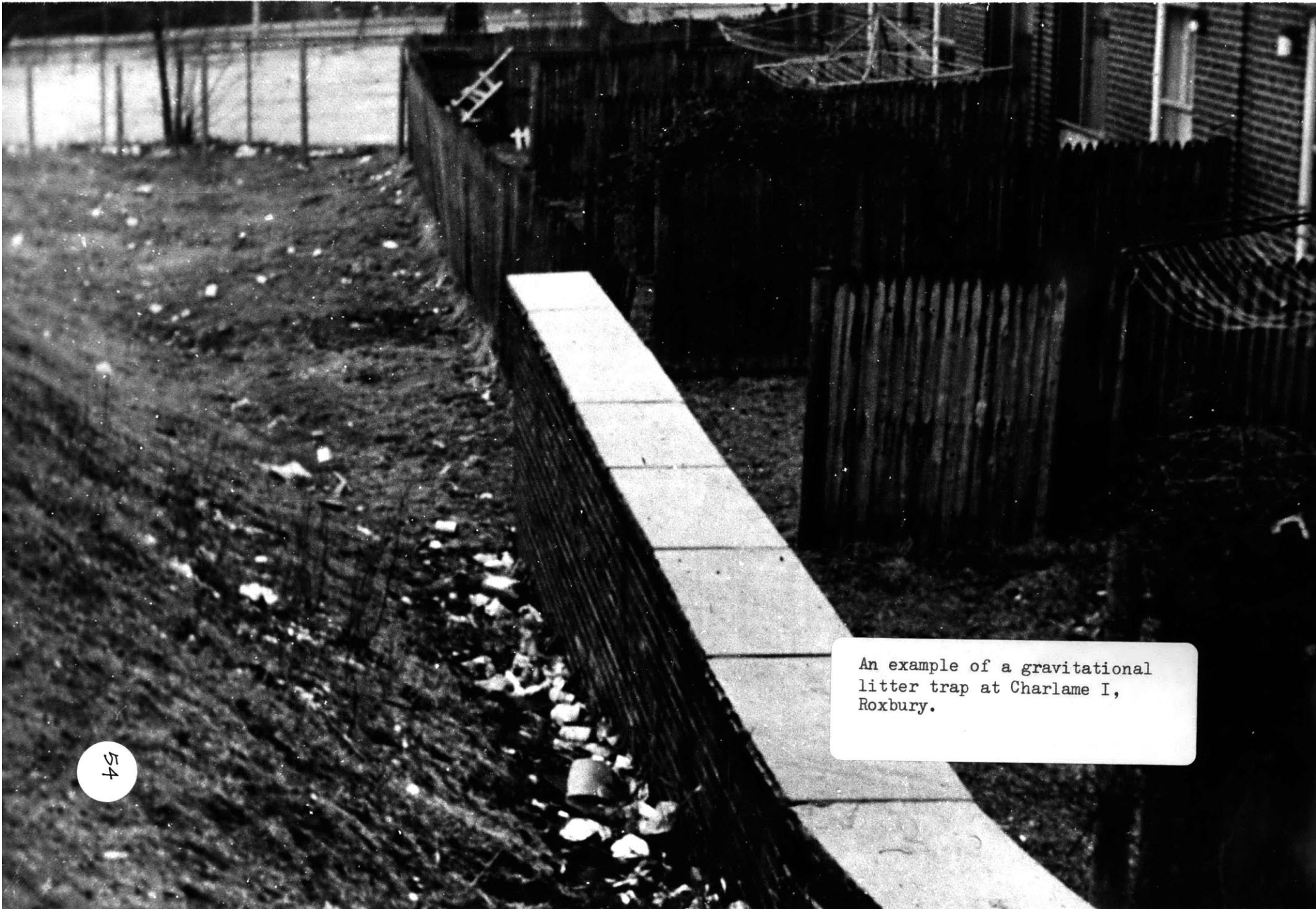
The principal of the filter is probably the most observable of the

site details that collect litter. Wind or gravity (a constant force) drives litter to a filter where the litter-object is stopped and held even though the force continue to act on it. The best example of the filter is the chain-link fence with papers plastered against the fence in a wind and cans and heavier objects at the base of the fence. Filtering also occurs in large quantity by low shrubs and plants. Plants are also a favorite target for litterers because, as stated in the preceding section, plants tend to make litter less visible. In addition, the multiplicity-factor mentioned also in the preceding section probably plays a major role in where litter gets dropped: people tend to litter where litter already exists.

Pattern: If it's difficult to clean-up, it usually won't ge cleaned.

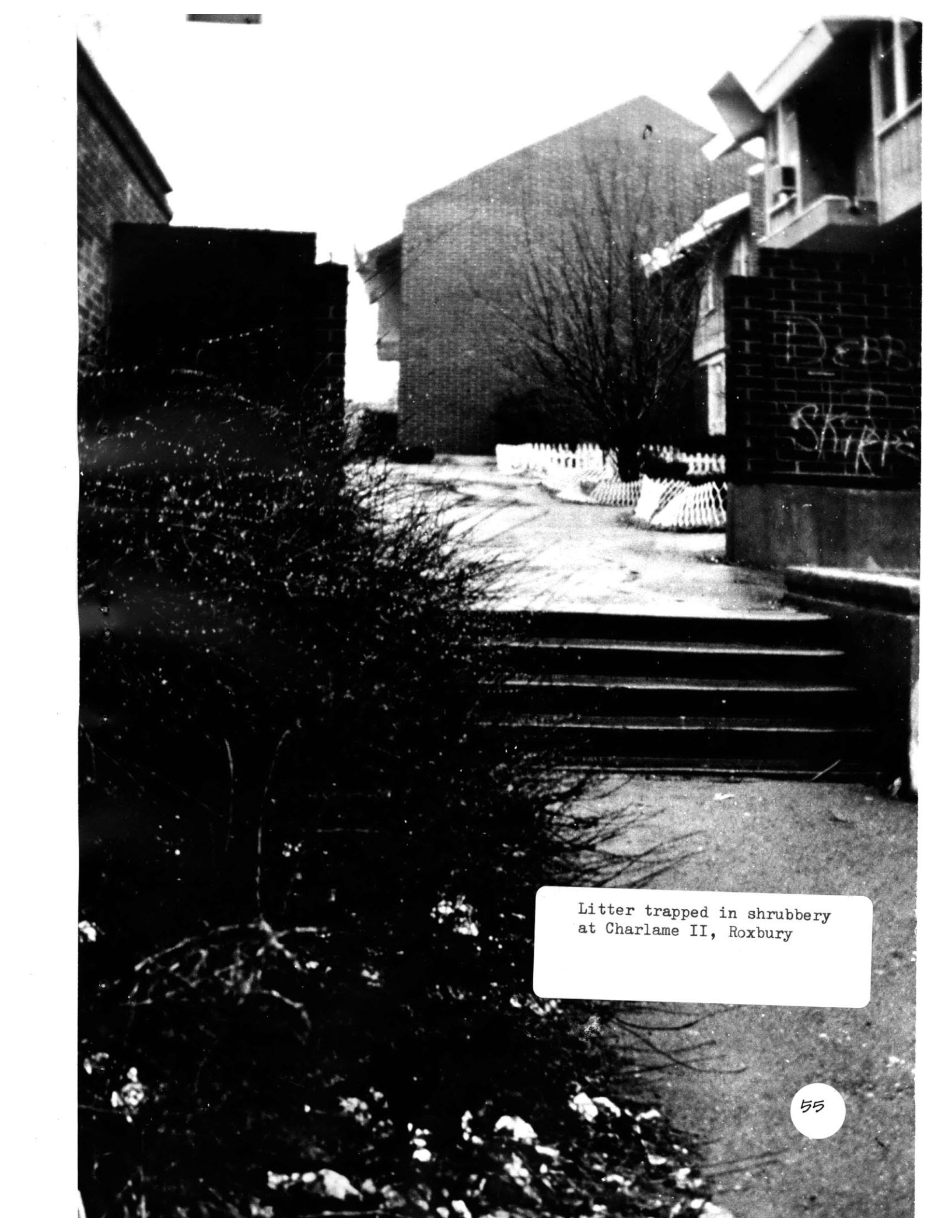
The importance of the above section is primarily that the dynamic property of litter influences the clean-up pattern by making an area either more or less easy to clean up.

"Difficulty" in cleaning up might be defined in two separate but related ways: (1) mechanical difficulty in simply getting at the litter and removing it and (2) volume difficulty where there is just too much litter to confront, remove, and store. Sometimes there exists situations where there is a lot of litter in hard-to-get-at places. An example of this is at Warren Gardens where a row of closely planted shrubs borders the sidewalk where trash cans are collected, and even though the walks and yards that adjoin this planting strip are kept relatively clean, the planting strip itself seldom gets cleaned.

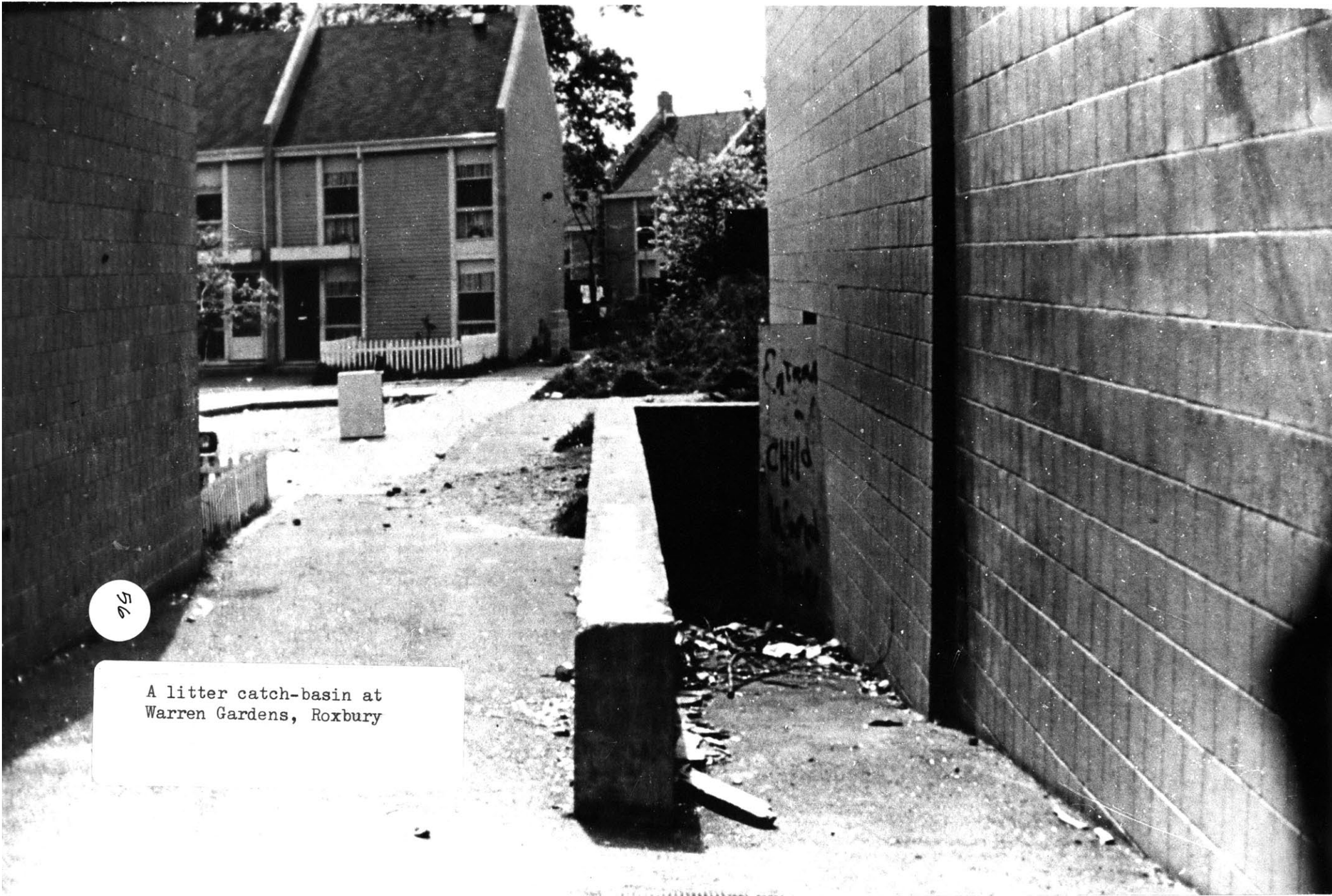


An example of a gravitational litter trap at Charlame I, Roxbury.

54



Litter trapped in shrubbery
at Charlamé II, Roxbury



56

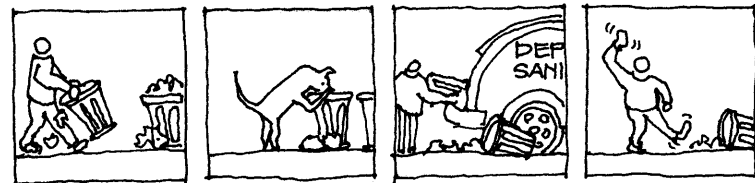
A litter catch-basin at
Warren Gardens, Roxbury

a litter pattern:

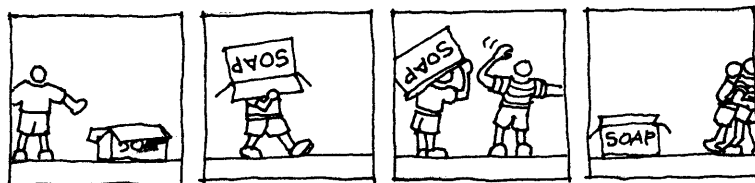
origins

SOURCES

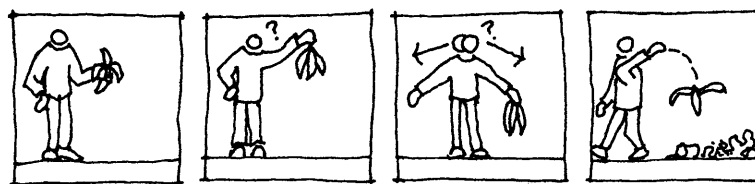
• spilled garbage: things that are meant to be formally disposed of and carried away but somehow become litter on the site



• children and outdoor play: left overs and by-products from the people who actively use open space the most



• litter: the 'random' placement of objects that are not intended to be retrieved or re-used



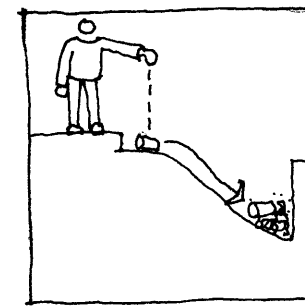
CAUSES

- faulty container:
 - too small-- overflow
 - difficult to use-- spilling
 - fragile-- dogs, breaking, bursting
 - open-- wind, dogs
- poor or inadequate service:
 - infrequent service-- overflow
 - poor service-- spilling; misplacement of emptied container
- low resident responsibility:
 - lack of 'expertise' (children)
 - disrespect for an undependable system

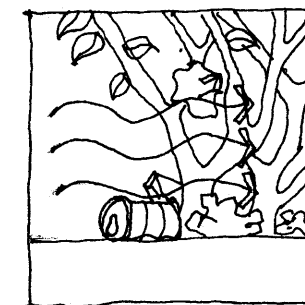
- children spend a lot of time outdoors
- they have (carry) with them a lot of paraphernalia; much of it is disposable
- there are 'favorite' places on the site where children play and congregate (concentrate)
- children tend to be less discriminate as to where they leave (or throw) this disposable paraphernalia.

- the lack of or inaccessibility of 'proper' disposal facilities
- the existence of a lot of litter in a place makes it easier to also litter in that place (acceptability).
- knowledge that the litter will not be seen (hidden) or that 'someone' will clean it up (the people who get paid to clean it up)

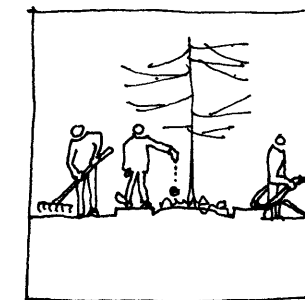
destinations



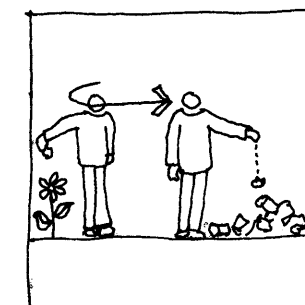
depressions: gravitation of litter until it can fall no more.
examples: open stairwells, curbs and retaining walls, tree wells, ditches



filters: trapping of litter against a constant force (wind, gravity) or a single force (kicking)
examples: low shrubbery, fences



'ambiguous' turf: if it 'belongs' to no one, it is not a violation of anyone's turf to litter. it is also nobody's responsibility to clean.



proliferation: probably the most common destination. littered areas tend to become more littered; clean areas tend to remain clean.

3.2 Describing a Clean-Up Pattern

The purpose of this section is to attempt to describe the conditions whereby housing sites get cleaned-up. In doing so, it arbitrarily divides the actors into three distinct groups: the individual resident, groups of residents (neighbors) who do "collective" clean-up, and institutional concerns (management and municipal services). In reality, with conditions changing from site to site and from day to day, such a breakdown probably does not exist, at least, not as cleanly as might be supposed by reading the following remarks.

The purpose for doing this categorizing however stems from the fact that it is much more difficult to observe clean-up patterns than it is to observe littering patterns. Sometimes, for example, it might be assumed that continuous clean-up takes place in an area when in fact there is no littering in the first place.

In attempting to deal with this situation or possibility, an experiment of dubious ethics was conducted in several places of most housing sites. The experiment consisted of placing an object of litter (a red and white cigarette package, twisted into a butterfly shape, with an elastic band wrapped around the twist) that would look like litter but could be identified by the experimenter in or at a part of the site where clean-up patterns were in question. If the objects dissapeared in time it was assumed that clean-up did take place. If they remained, it was probably the case that litter did not happen there and that was the reason for its being clean.

This experiment, hereinafter referred to as the cigarette-pack experiment, exemplifies the difficulty in identifying and describing clean-up patterns on housing sites. Such being the case, the following

patterns are presented not as facts as derived by observation, but more as tendencies based on observation, experiment, conversation (as opposed to interview), and some amount of conjecture.

Site Clean-Up Done by Individual Residents

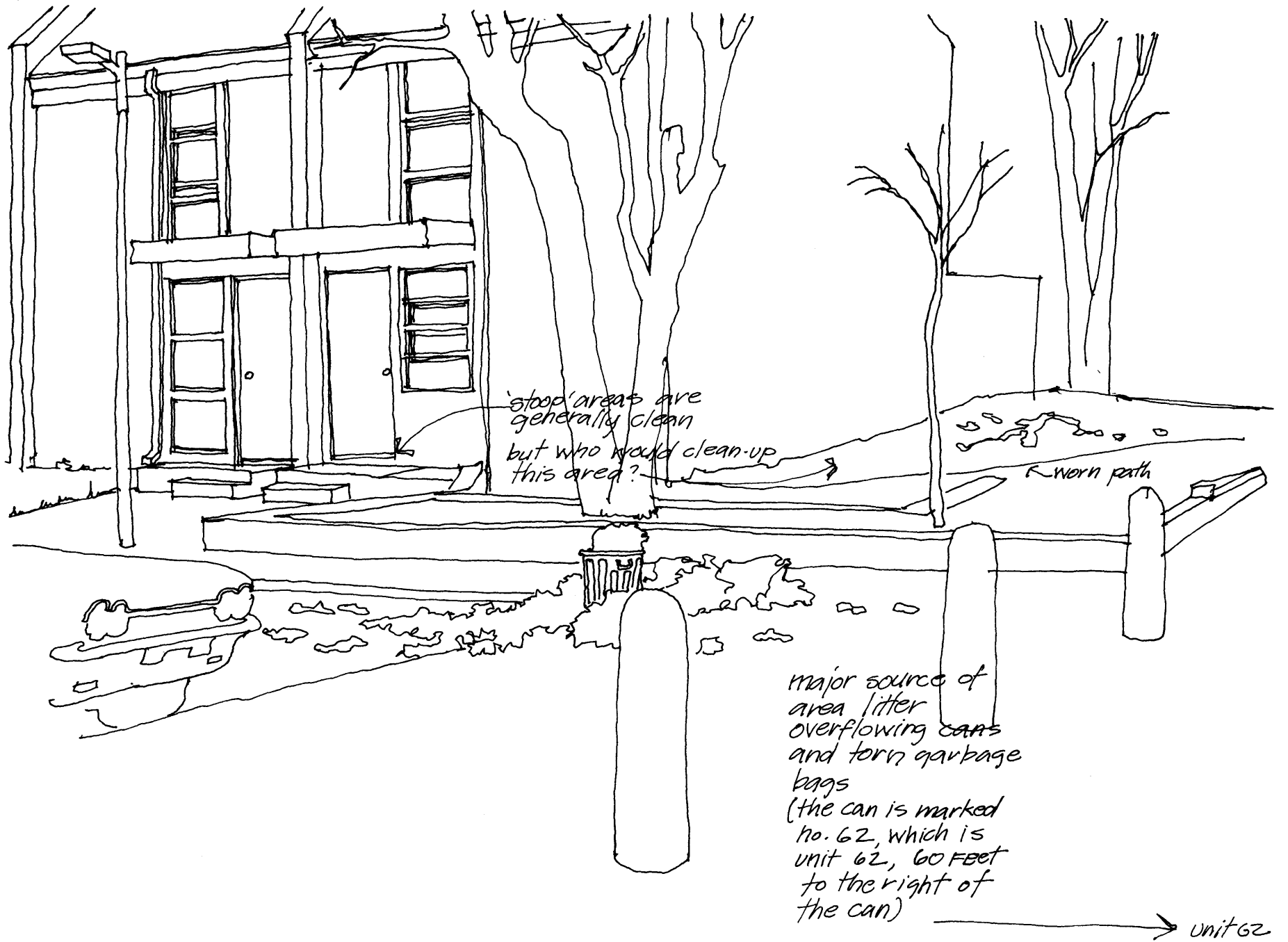
Pattern: A resident is more apt to clean up the "yard" spaces of a dwelling if that yard's boundaries are clearly defined from both "public" spaces and adjacent yards.

It is an assumed responsibility of a tenant to do the cleaning within the dwelling unit. Such being the case, the question arises, How much of the site outside of the dwelling unit "belongs" to a particular dwelling unit?

For "front yards", the non-circulation space around the "front" entry to a dwelling, it appears that those devices which signal the outsider that that space is somebody's turf (via fences, curbs, elevation changes) are also the devices that indicate to the resident that that space "belongs" to the dwelling unit and is the maintenance responsibility of that dwelling. Litter levels are usually lower when such yard space have boundary definition, and most yards tend to be somewhat regularly cleaned (with seasonal variations) if that boundary definition exists. The same cannot be said for yards that have no boundary definition.

The cigarette-pack experiment seems to support this theory. Of five packs placed in five such defined yard conditions with varying degrees of present litter, three of the wrappers could not be found two weeks later. However five packages were placed in yards of questionable definition (particularly in the side-by-side direction) and all five were present after the two-week waiting period.

There are probably many explanations for this happening, but three that are felt to be important by this study are (1) that the boundaries,



stoop areas are generally clean
but who would clean-up
this area?

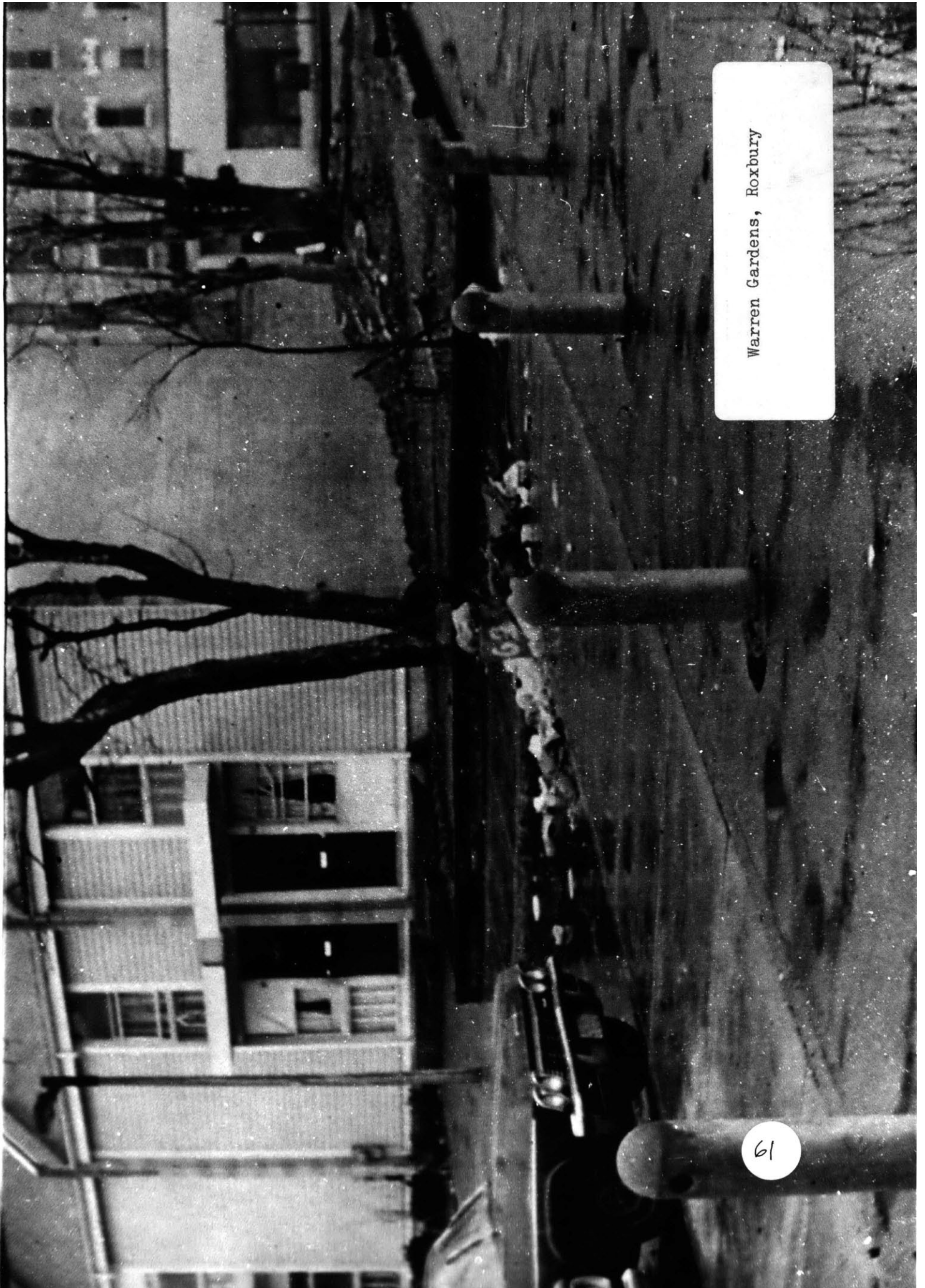
worn path

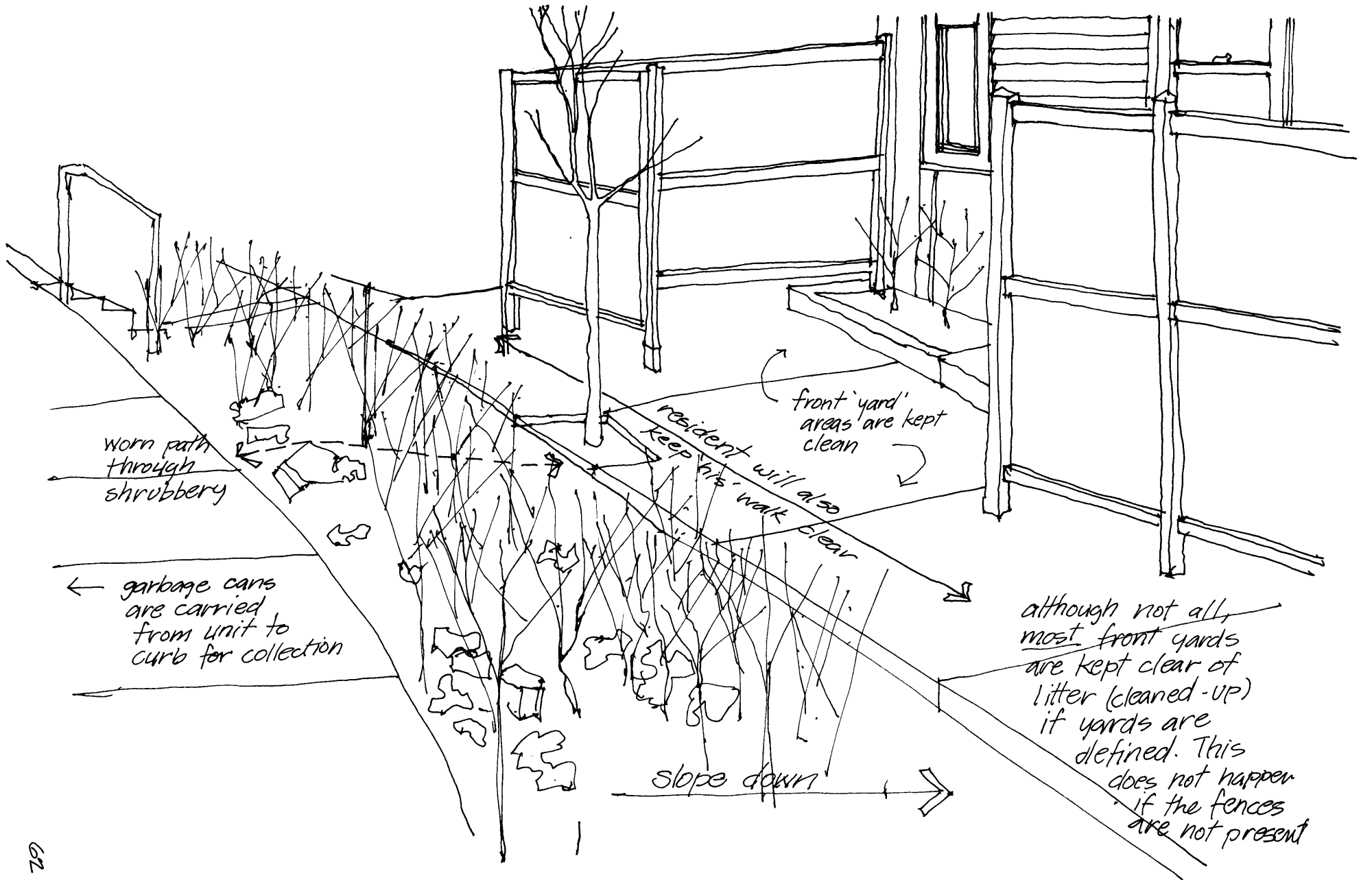
major source of
area litter
overflowing cans
and torn garbage
bags
(the can is marked
no. 62, which is
unit 62, 60 FEET
to the right of
the can)

→ unit 62

Warren Gardens, Roxbury

61





worn path through shrubbery

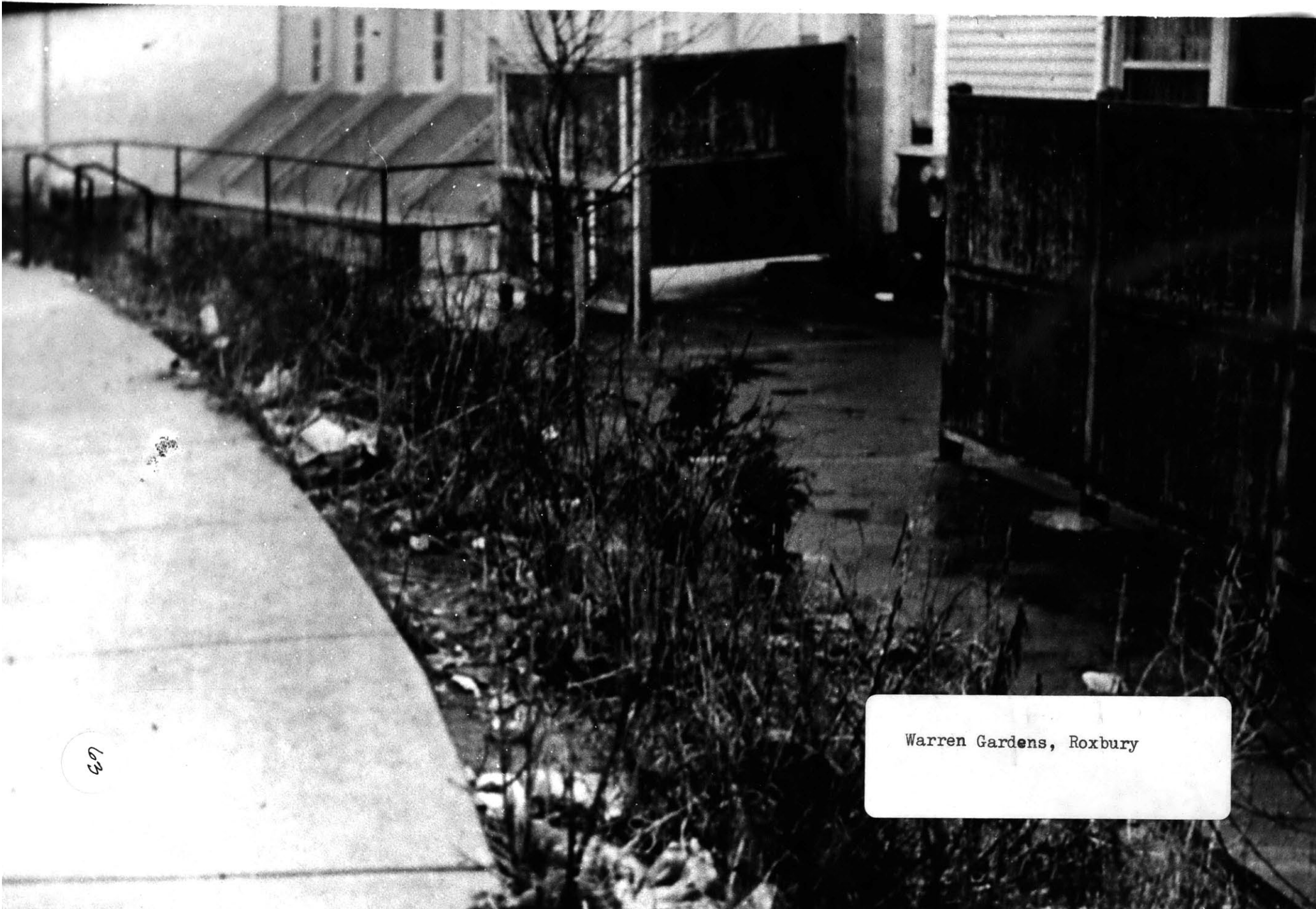
← garbage cans are carried from unit to curb for collection

resident will also keep his walk clear

front yard areas are kept clean

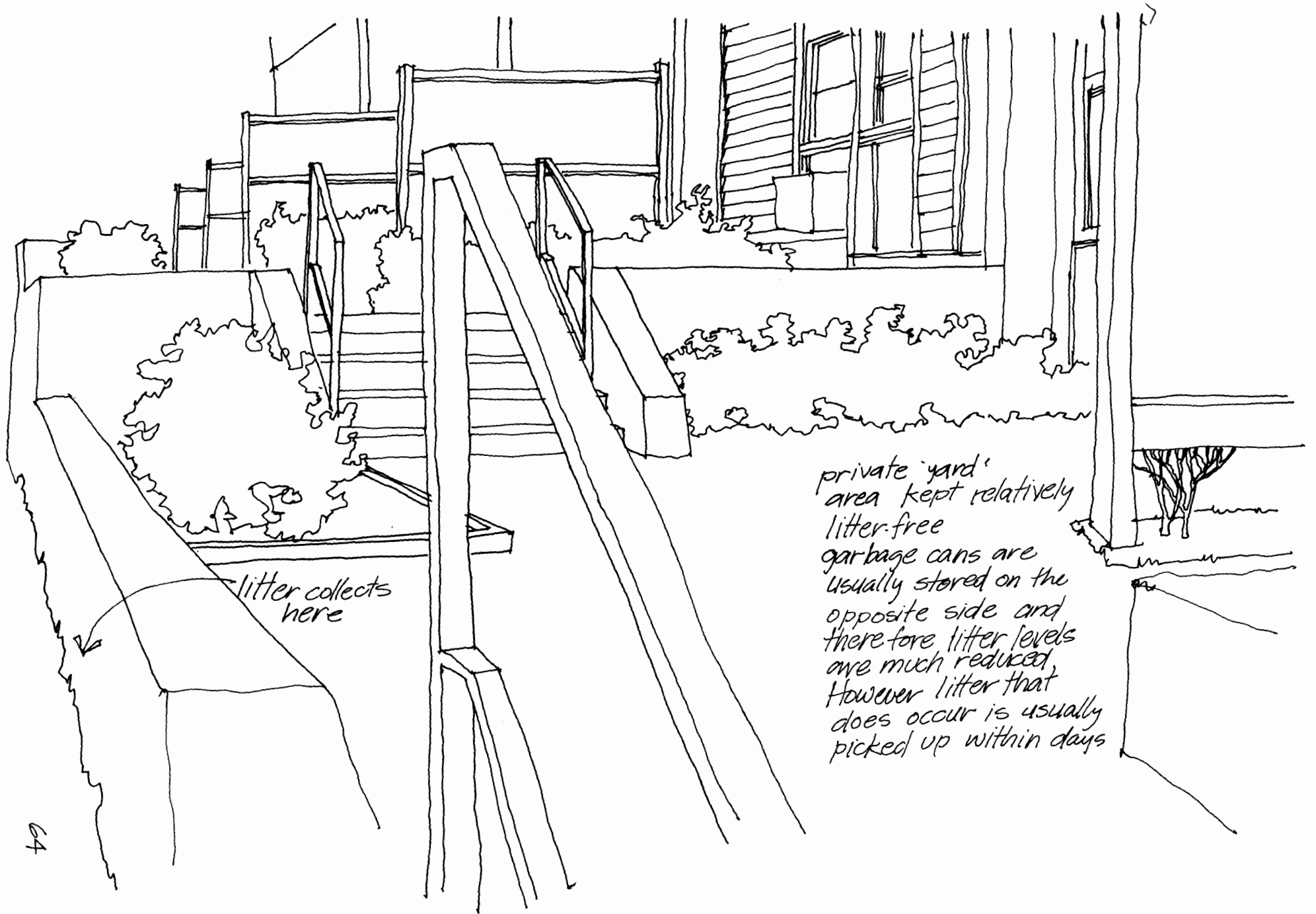
slope down →

although not all, most front yards are kept clear of litter (cleaned-up) if yards are defined. This does not happen if the fences are not present



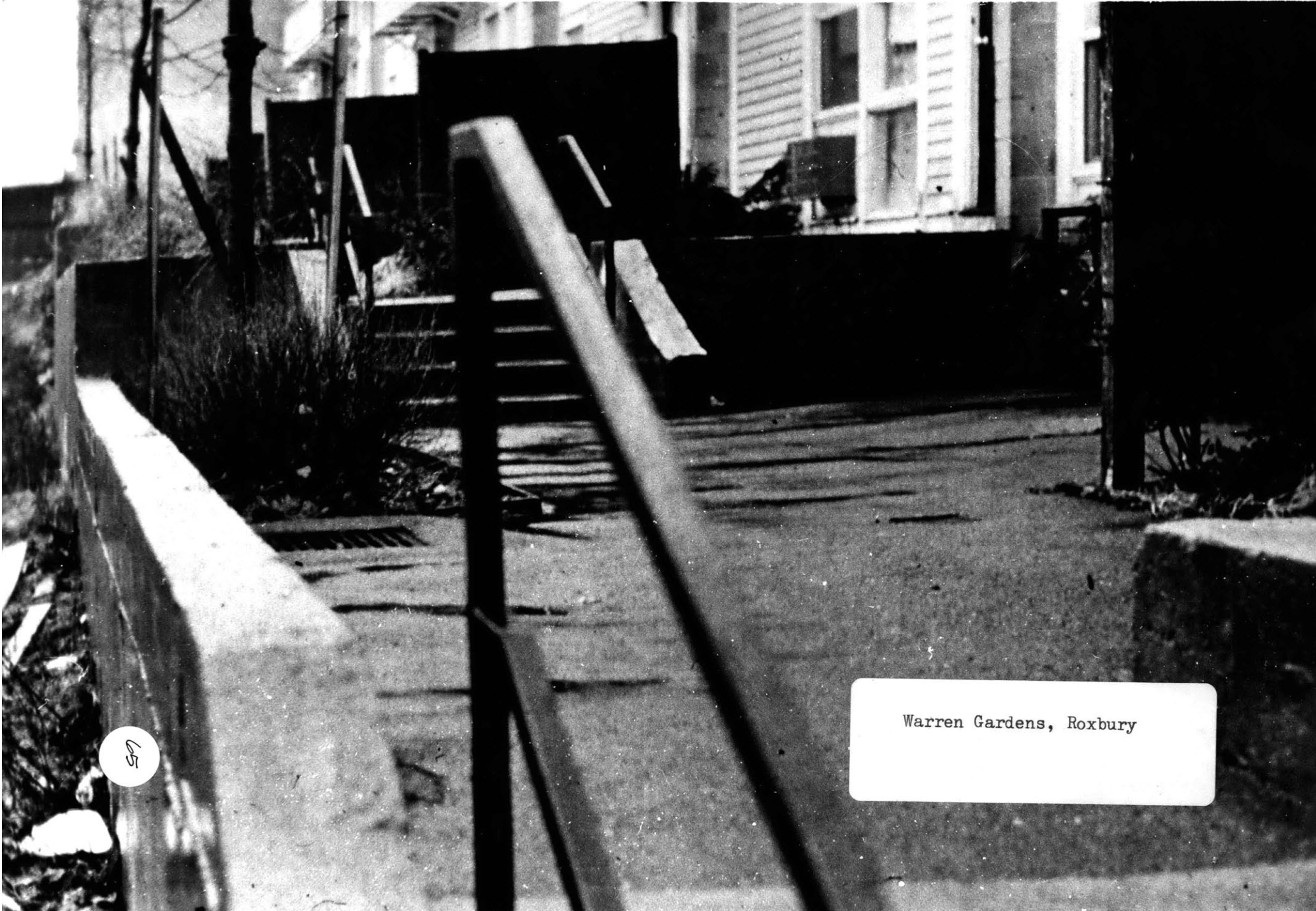
63

Warren Gardens, Roxbury



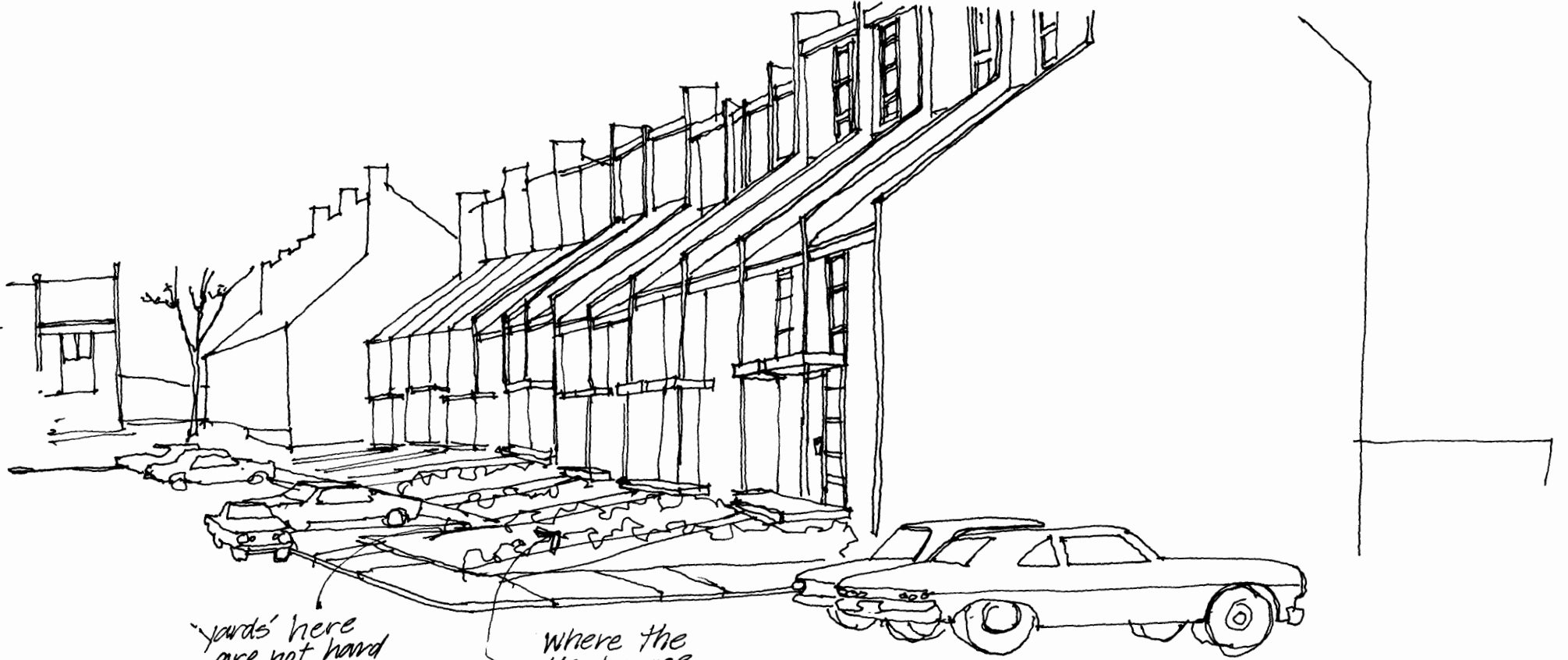
private yard
area kept relatively
litter-free
garbage cans are
usually stored on the
opposite side and
therefore litter levels
are much reduced.
However litter that
does occur is usually
picked up within days

litter collects
here



55

Warren Gardens, Roxbury



yards' here
are not hard
paved; much
uncared-for
planting. it's
easier to sweep
a hard surface
than to rake or
pick up a soft
surface

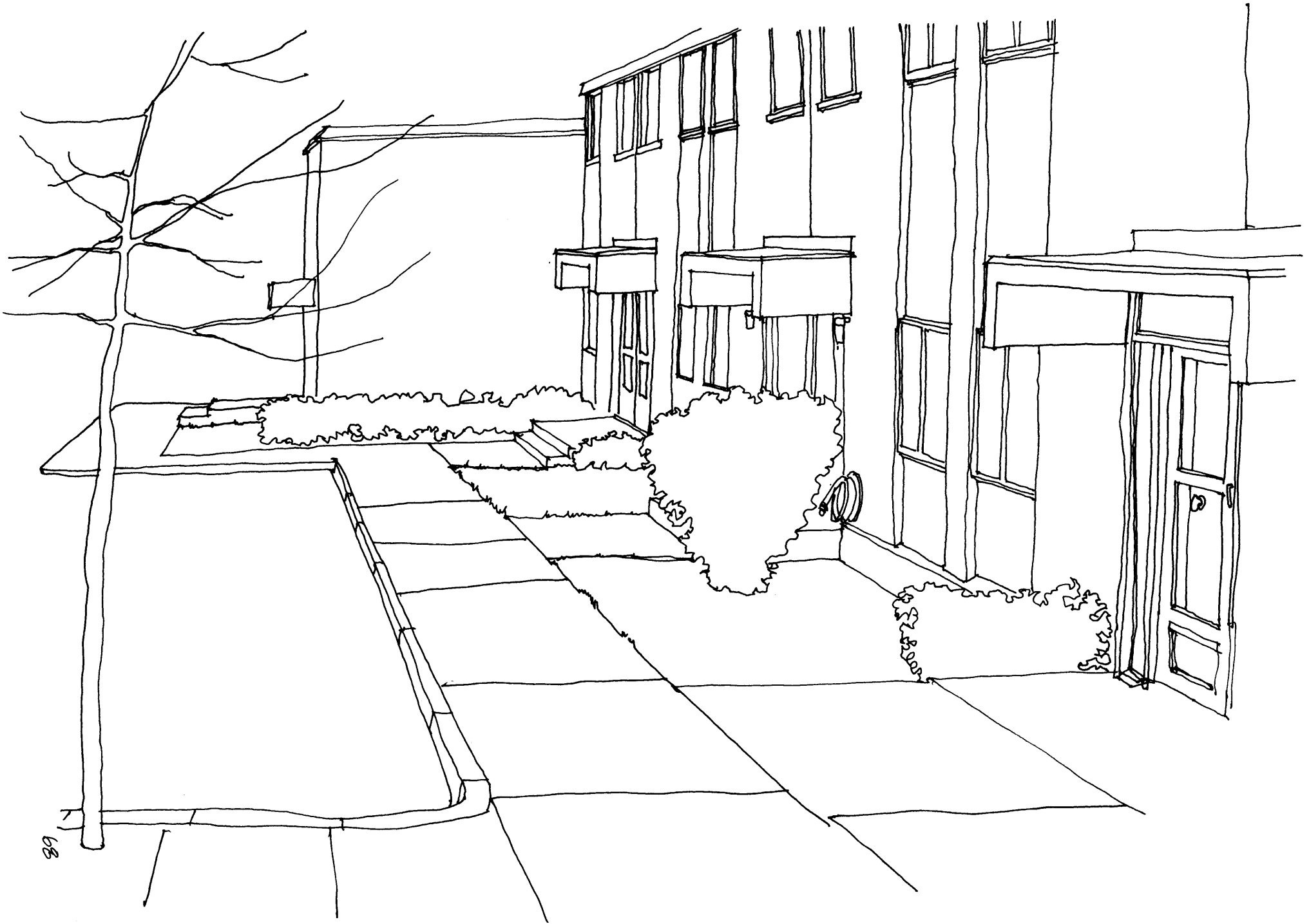
where the
yard space
becomes ambiguous
through common walks,
'public' ownership of
parking lots, lack of
defined boundaries,
litter collects

here again, garbage
is carried from
the unit to curbside,
twice a week



Warren Gardens, Roxbury

67





69

Charlame I, Roxbury

or "edge-markings" represent to the owner of the yard a finite area of responsibility that can be reasonably maintained by a household, (2) that less littering is done on these defined areas and, as littered areas tend to become more littered, so do clean areas tend to remain clean (for reasons of both littering and clean-up), and (3) that a clean yard represents an investment and a source of pride both to the owner and to others who happen to see it if that yard is "assignable" to a specific house.

"Rear" yards tend to follow the same patterns as the front with the following exception. There seems to be a correlation between the amount of "furniture" (such as barbeques, chairs, clotheslines, etc.) or other evidence of use of the rear yard and the amount of litter found in yards, which might indicate that the more a yard is actively used, the more chance there is of resident clean-up of that space.

Pattern: Litter is less likely to occur and remain in areas where a resident's ownership-rights are reinforced by a time/money/energy investment in do-it-yourself beautification or improvement. (Flowers as anti-litter.)

Related to- and reinforcing the foregoing pattern is the observation that in some instances, residents not only maintain a defined yard space but also take steps at making that yard more "presentable" and attractive. Or, in the absence of any given physical definition of yard boundaries, some people proceed to stake-out and define that yard which then becomes theirs to enjoy and maintain. A more mundane and somewhat less poetic reason for the appearance of the low, white picket fences is probably that they serve as a deterrent to cross-pedestrian traffic that tramples shrubbery and wears out lawns. But whatever the motivation, yards that have such do-it-yourself investments also have observably lower litter levels than their unfenced, un-planted neighbors.

There are some possible explanations for this. First, the fences may act as barriers (filters) to litter that is blown or kicked along the ground, and therefore a lot of litter never gets into the yard. A second possibility is that a litterer might be more conscious that litter dropped here is definitely on private turf and prefers in turn to drop it somewhere more appropriate. A third reason is a reiteration of the first pattern, that maintenance responsibilities here are "self"-defined and this situation is reinforced by the fact that one's investment in the outdoor space needs to be maintained and protected.

Sometimes, however, the fences get torn down and if they are not quickly put back into place, the process starts reversing. Respect for the turf seems to be lost by both the owner and the non-owner. In the cases where this has happened levels of maintenance deteriorate even to the point where the fences and flowers (if plastic) themselves become litter in the yard.

Pattern: Individual resident clean-up of communal and public space sometimes happens.

Safety hazards seem to be the primary motive for the person who volunteers his/her service to clean up areas of the site that are not privately-held yards or courts. Usually the task is limited to clearing broken glass or cans from a playground or bottles and glass from a parking lot. However on occasion someone will begin by cleaning a "private" area like the stoop or yard and eventually cleans up much more of the site. Only once was a person observed cleaning public space as a designated task: a teenager at Warren Gardens sent out by his mother to clear a public planting strip that was clogged by spilled garbage. However, such occurrences seem to rely on an active, concerned/disgusted resident and rarely happens.

Collective Resident Clean-Up of Communal Areas

While individual clean-up of communal space happens rarely, collective resident clean-up, or clean-up that is done either by individual residents working independently and regularly or by organized group action, takes place in certain circumstances with much greater frequency. What seems to be at issue here is that the area is indeed "communal" or shared by a set number of households rather than being privately held by individual households or being "public" space that is accessible, usable, and claimable by anyone. While it is not the intention of this study to define the various ways in which a space becomes communal, what might probably be safe to say is that as far as physical design is concerned, similar rules seem to apply to common space that apply to private space: that if the area is defined to "belong" to a determined group of houses through the use of fences, elevation changes, etc., a feeling of community has better chance of happening over the space, evidenced by collective resident upkeep.

There is, however, one major difference between communally-held property and privately-held property, assuming that physical definition of ownership exists in both cases. The private yard is in the "control" of one household or one person which makes it easier to act on a desire to clean up the yard because of its relative size and because in the nuclear-family situation the process of decision making on matters like yard cleaning is usually simple: the household-head says to clean and it gets cleaned, either by the head or by the subordinates or by everybody. In comparison, communally-held areas do not automatically respond to one or several residents desire for a clean space; indeed, many opinions may be held by individual residents as to how clean the space needs to be.

Some residents will undoubtedly have tolerance or acceptability of litter levels that differ from other residents. But even if a homogenous attitude among residents exists, each resident must be aware that there is a general consensus that the area needs cleaning. A person is not about to clean a communal area if it is felt that the other residents will immediately mess it up again or if it is felt that the other residents will object to him or her doing so. In other words, communication and neighboring among the constituent residents of a communal space is an essential ingredient for a complete definition of that space.

To illustrate these two considerations, physical definition and communication, three different sites will be examined. At Warren Gardens, on the highest part of the site there is a doughnut-shaped group of houses, the center of which is a common court. The court serves as a common entry to thirteen row houses whose fronts face onto the court. By degree of enclosure by the surrounding houses and by changes in elevation from the street to the court, the space is a good example of physical definition of common property. However in conversations with some of the residents who live here it was learned that regular conversation among the residents is rare and most of those talked to do not know their adjacent neighbor. All of the people talked to seem to think that the court is dirty and should be cleaned up. But the court is a litter trap rather than being commonly-used and maintained property.

At Cochituate Homes the reverse is true. People seem to know many other people on the site by name and because the development is a co-operative, there exists a mechanism by which people regularly talk to each other and express common and differing attitudes and goals. Most people seem to agree that the site as a whole "belongs" to each dwelling; children

play on most of the site. However ambiguous turf runs rampant on the site. To an outside observer it is extremely difficult to guess what areas are private, what areas are communal, and what areas are public. The only major collective resident clean up that takes place on the site is a semi-annual clean-up day for the whole site. On this occasion large numbers of residents turn out to clean up and only through this mechanism does litter get collected and carried away by the residents.

At Presidential Courts the site is organized into four separate courts around which are grouped about twenty-five row houses whose front entrances face onto the court. The degree of enclosure and unit orientation are similar to that of the court at Warren Gardens. Presidential Courts is also a cooperative and a fair amount of neighboring goes on both within the court and by occupants of houses that are on different courts. While littering goes on to some extent on other parts of the site, the courts are kept essentially clean. The cigarette pack experiment was conducted here with four to five packs deposited in each court in varying locations. After two weeks, a search revealed only one pack and that was found outside of the court.

Thus, it might be hypothesized that the following pattern tends to be valid:

Pattern: Collective resident clean up takes place more readily in communal areas if that area is physically defined to belong to its constituent dwellings and if the constituent communicate with each other (visually, verbally, or otherwise) to establish common attitudes and goals.



75

The communal court at
Warren Gardens,
Roxbury



76

A typical common space
at Cochituate Homes,
Framingham



The communal court at
Presidential Courts,
Stoughton

The Role of Management

Given the level of service that management usually contributes to site clean up, it is evident that on most housing sites of the type investigated, resident clean-up of private and communal areas is an essential part of total site maintenance and housing management. It is also evident to the author that resident clean-up activities will probably never encompass the whole site and that management must provide assistance to the tenant by cleaning those areas that do not lend themselves to resident care.

Pattern: Recognition of litter problems is more apt to happen when there is mutual respect and communication between management and tenant.

The traditional pattern that describes the relationship between management and tenant usually takes the form of rules and regulations written as part of the conditions of the lease agreement. Implicit in the agreement are the conditions that residents should maintain private outdoor spaces and refrain from abuse of the site in general while it is the management responsibility to maintain and attend public areas where abuse does take place. Like most contracts, the rules and regulations of the lease agreement is a two-way system that relies on the adherence to the agreement by both parties, the tenant and management.

The problem arises when for whatever reason, the management fails to keep up its end of the bargain, since through threat of eviction, rent increases, etc., the management obviously holds the power when conflict arises. In the case of littering, such breaches of contract are commonplace in 236-type construction, because site clean up has relatively low priority in total maintenance costs compared to items such as dwelling repairs and replacement, attention to hazardous conditions, faulty construction, etc.

If litter levels get recognizably high, it will become a major source of resident dissatisfaction and the whole clean up process of resident and management begins to crumble. Such is the case observed and gathered through conversation with residents at Warren Gardens. Resident clean up of a micro-area of the site starts to become meaningless when the rest of the site is in a mess.

A way of addressing this problem is in evidence at Cochituate Homes, a co-operative development. In such an arrangement, the tenant is part owner of the development which has no immediately realizable economic value to the tenant, but in this particular case it does have effect on attitudes and the tenant-management relationship. Through a board of directors, elected from and by the residents, a resident has say in the selection of a management company and in management policy. Maintenance people are also residents of the development. Because of this structure the management also has improved communication to residents to explain problems. The managers are on the site at least one day a week and relationships with the residents is evidenced by the fact that both the manager and assistant manager know many children and most adults by name, and most people on the site are on a conversational basis with the management. The present result of this situation is not visible: litter levels at Cochituate Homes remains high (even in comparison to most inner city projects) and many problems with site maintenance exist. The difference between this project and Warren Gardens is the tolerance-level of the residents toward litter caused by the understanding of the problem management faces in total project maintenance, and because of this are not hostile toward management. At the time of this writing a clean-up day is scheduled for Cochituate Homes and according to a maintenance man on the

site, a large turnout and co-operation is expected in this campaign. At least, it worked last year and people seemed to enjoy themselves.

Cooperatives in themselves offer no answer to tenant management problems; there do exist projects which have a cooperative structure but no cooperation. But a cooperative organization offers at minimum a mechanism for tenant-management communication which is vital in fostering mutual respect as well as offer a mechanism for communication among residents.

Communication is held by this study to be the important link between management and tenant. If no mechanism for ongoing communication exists, what are the alternatives?

In conversations with some residents at Warren Gardens and Roxse Homes, it becomes evident that there are too many do's and don't's in rules and regulations and not enough why's. It is the management's responsibility to inform residents of site clean up patterns and methods. More importantly, in view of management constraints, it is essential that the management inform the resident of its limitations and where litter-problems are known to exist. Too often this is not done.

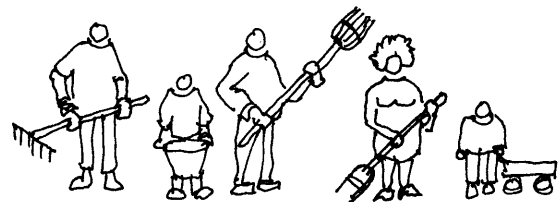
Finally, where possible, management should aid the resident in self-maintenance efforts, if not in actual manpower, then at least in equipment and instruction. Of seven people asked at Warren Gardens if they possessed a rake and shovel, one person replied that she possessed both, two answered that they own shovels, and the remaining four possessed neither.

the clean-up pattern

linear:

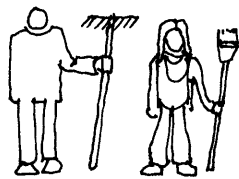


if not,



collective resi-
dents will.

if not,



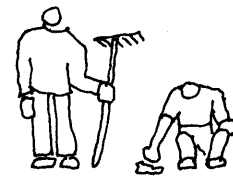
individual resi-
dents will

if: vacancies call for a more presentable site to attract new tenants, if there is adequate money for site maintenance, if existing tenants demand litter removal, or if litter levels get too high because nobody else will clean

if: there is resident recognition of management problems, if there is common negative-reaction to the existence of litter, and if the job can be done incrementally or quickly.

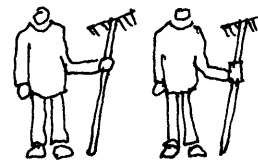
if: the outdoor spaces 'belong' to the dwelling unit, if that place will stay reasonably clean (once cleaned), if it does not require unreasonable personal investment in time or money, and if other residents are doing the same.

simultaneous:



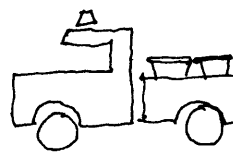
individual residents clean 'private' areas such as stoops, yards, walks, etc., that are defined and bounded (as one would clean his/her own dwelling)

and



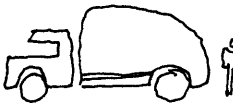
help with collective clean-up either by group-action or by simultaneous residents each cleaning their 'share' of commonly-held spaces.

while



management cleans or helps clean 'ambiguous' and problem areas such as the dumpster location (which also makes for management credibility and respect by the tenant) and

while



municipal services such as garbage collection, street sweeping, snow removal, etc. are regular and efficient.

4. CONCLUSIONS: SOME STATEMENTS ON HOUSING AND LITTER AND THE STUDY

4.1 Larger Findings Based on Comparison of Projects

The primary purpose of this section is to disclaim some unstated assumptions that were held at the beginning of the study.

The major purpose in selecting projects of varying locales was to prove that litter on housing sites was highly influenced by the surrounding environment (the location) of the site. In other words, it was assumed that litter levels would tend to be higher for sites that are in a highly littered area (South End) than would sites that are in less dense, less littered areas. This cannot be proven by using methods employed for this study; in fact, the opposite can be clearly shown to happen by comparing the litter levels of Cochituate Homes, Framingham, with Roxse Homes, Boston, or even more clearly, Cochituate Homes with Charlame or with Westminster Court.

Second it was assumed that litter levels would be influenced by whether or not a dwelling had ground contact. The findings show that litter levels are neither consistently higher nor lower for walk-up apartments than for row houses.

What is demonstrated by the study is that litter, if nothing else, is highly influenced by what-goes-on on the housing site: the people, the institutions, the design, and most of all, the interaction of the three.

4.2 The Validity of Litter as an Indicator of Activity

The basic initial assumption of this study was that litter represents a form of abuse of the open spaces of the housing site, and such being the case, the thesis assumes a biased stance against litter. But aside from the fact that residents are not the primary generators

of litter on housing sites, there exists a dilemma in the mind of the author as to whether litter is indeed representative of the attitudes of the users of a given space. Certainly in extreme forms litter can be inhibitive to activities that would otherwise take place in an area. Litter can also conceivably be a major health and safety hazard, and it is also conceivable that people could use litter as a statement of low esteem for a place by intentionally trashing the area. But such conditions were not observed on the housing sites investigated, at least not in any form that could be positively identified.

Near the end of this study I went back to Warren Gardens and Cochi-tuate Homes to have a final look around. As has been mentioned these sites are the most heavily littered of the projects investigated. In the open spaces of the sites were myriads of kids and a sizable number of adults, all talking screaming, fighting, playing and sitting around, fixing cars, and digging up yards. The implication here becomes clearer: a place cannot become littered if nobody uses the place; litter (as opposed to spilled garbage) rather than being a form of abuse, may be considered more simply a by-product of use. If this is true, it raises some questions certainly on this study, but it also raises some questions about the nature of design and designers of housing. Is there a normal pattern of behavior of residents of rental housing? Does the pattern of behavior on housing sites coincide with the pattern ascertained or imagined by the designer? Is it the objective of Design to match the discrepancies that exist? Should the designer try to "design-out" litter from housing sites, or is it responsibility of the designer to also draw litter and worn-out grass in the rendering?

Some of these questions can be addressed or understood more fully

again by looking at the apparent clean-up patterns on the various sites. If the observations are correct, there are people who litter on the site and there are people who energetically react to the presence of litter by cleaning it up.

And maybe, given this viewpoint, this is the purpose of the thesis. Instead of looking to the study for recommendations or suggestions or "usable" information on litter, management, and housing site design, it may be more useful to the reader to consider litter a vehicle or story-line that runs through and helps describe the things that go on on the housing site: the people, the conflicts, the activities, the institutions, all operating day to day in a recognizable physical environment.